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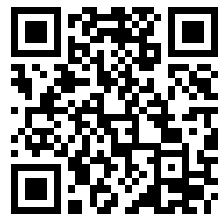
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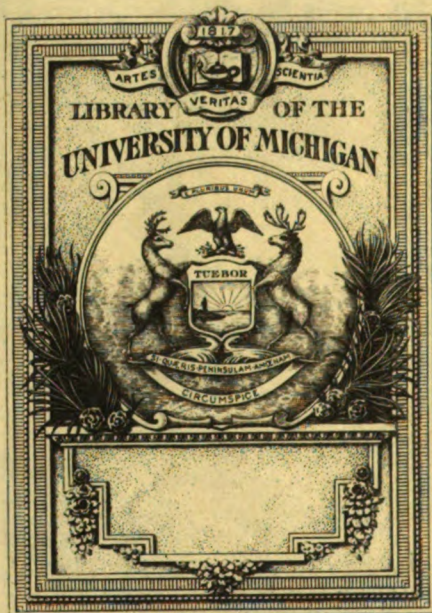
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THE PHOTOGRAPHIC JOURNAL OF AMERICA

VOLUME LIV

JANUARY, 1917

NUMBER 1

This Number Contains:

**AN ARTIST OUT OF THE
EAST**

By W. H. Porterfield

ON BACKGROUNDS

By Sadakichi Hartmann

OUTSIDE TRADE

By C. H. Claudy

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SELF-PORTRAIT
BY C. CROWTHER
KOBE, JAPAN



The
PHOTOGRAPHIC
JOURNAL
of AMERICA

VOLUME LIV

JANUARY, 1917

NUMBER 1



AN ARTIST OUT OF THE EAST

By W. H. PORTERFIELD

PERHAPS it was a year, perhaps two years, ago that a print bearing the name of C. Crowther, Kobe, Japan, found its way from the land of the Mikado to a busy city in the Western world, and served as an introduction to the work of an artist who apparently was content when he pleased those clients who found their way to his little studio on the hill which overlooks the bay at Kobe.

As yet no salon juries have been asked to pass upon his pictures, and aside from the publicity which awaits the presentation of this article it is not said that he sought recognition in any way other than resulted in the approbation which came from discriminating friends upon whom he was pleased to turn his camera.

Whether it was modesty or an independent disregard for the world's opinion may never be known. Be that as it may, the little print above mentioned was his undoing, for soon after its arrival here a request went forward

for further samples, and as a result we are able to present to the readers of PHOTOGRAPHIC JOURNAL OF AMERICA a fairly comprehensive collection of prints which reveals unmistakable ability and a truly remarkable "up-to-dateness," notwithstanding the isolated location of the artist and consequent absence of pictorially inclined associates that when present contribute so much to one's progress, and from whom, as we all know, council and advice are invaluable.

If Crowther is without this advantage he has, as a partial recompense for the loss, a freedom from the influences of conventionality and that stultifying conservatism which has caused many a genius to cap his lens forever, because he dared attempt an incursion into the realm which prejudice and preconception have until very recently denied to the artist photographer.

It is a privilege sometimes to have been a pioneer and to have enjoyed an unrestricted development, particularly

(1)

when one possesses well-defined ideas of what one desires to accomplish. This apparently was the condition under which Crowther took up photography in Japan, some twenty years ago, and to it in no small degree may his individuality be attributed.

Running through a portfolio of prints we are forced to the conclusion that he never indulged in the hard, sharp, highly polished, hand-launders brand of portrait so commonly met with a few years ago, because he shows none in that style. Instead, we do find in his prints just that amount of diffusion which delights the eye, yet in no instance destroys character or removes a single line from the face of the sitter.

In the portrait of Tagoré, one immediately becomes acquainted with the great Hindu poet and philosopher, for so truly has the artist succeeded in his delineation of character that somehow this wonderful face inspires in one a deeper appreciation and a greater understanding of the beautiful and enchanting words in "Gatinjali," "The Crescent Moon," and "The Gardener," and we at once feel something of the benign influence of the man who in India is regarded as akin to the gods.

If one would challenge the versatility of the artist, surely the exquisite "Child Portrait" is sufficiently convincing to command the admiration of the most critical.

Beyond question, technically and pictorially, the mind is left to enjoy undisturbed the winsome sweetness of a lovely face with appealing eyes which look out over a wayward curl that so fortunately fell (?) into just the correct position to complete the faultless lines of composition.

Passing from what might be termed the poetical aspect of Crowther's work,

we find him equally sensitive to the more vigorous phases of human nature, such as are evidenced in the character of strong men and active women.

One could imagine no greater error committed by a portraitist than an attempt to apply the same rule and methods to all "manner of men." This Crowther does not do, and his prints prove it. To fully realize this fact it is obvious that a careful study of his work is necessary, just as one would make himself familiar with any subject in order to fully appreciate the subtleties that distinguish the consistent and intelligent craftsman from one that produces quantity rather than quality and hits a high spot now and then only by accident.

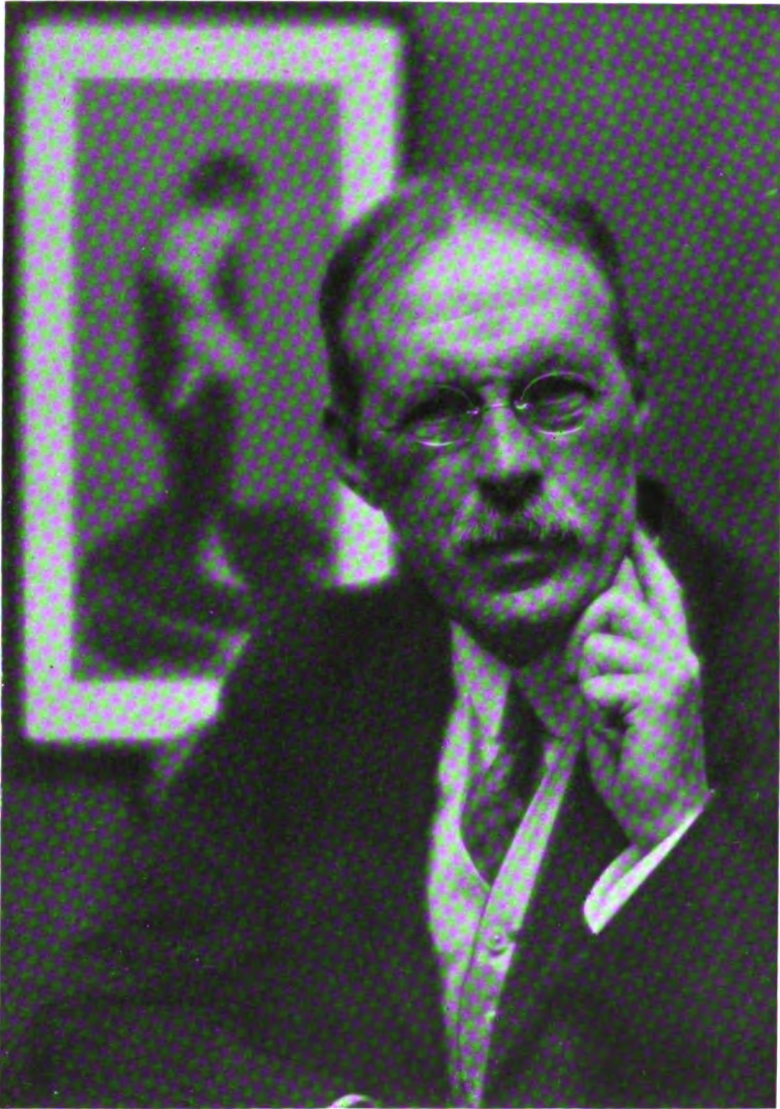
It would hardly be possible for any magazine, however generous with space, to reproduce any one person's work in sufficient quantity to cover the entire field of their activity, yet it is hoped that the readers of PHOTOGRAPHIC JOURNAL OF AMERICA will find in the accompanying illustrations ample evidence to warrant the brief notice given here and to accord to a successful portraitist in a distant land a little of the recognition to which he is so justly entitled.

Under what difficulties, if any, Mr. Crowther works; the time at his disposal which may be devoted to photography (he is not a professional); what equipment he possesses, we are unable to say, and after all, what does it matter? It is the mentality of the man which interests and concerns us. By his work we shall know him, not by the value of his apparatus, and it is by studying the former and not the latter that we will profit in our acquaintance with this Englishman, who, if not the first, was surely one of the earliest devotees of pictorial portraiture in Japan.



SIR RABINDRANATH TAGORE -
BY C. CROWTHER
KOBE, JAPAN





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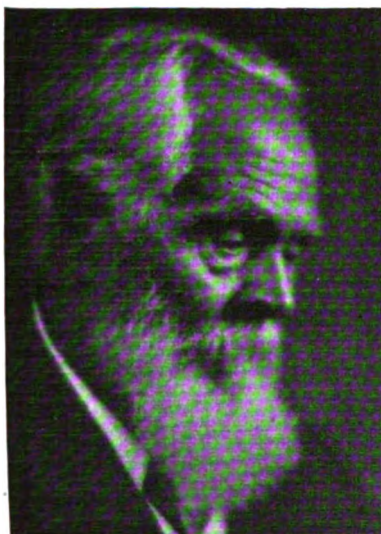
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"LOOKING PLEASANT AT THE
"PHOTOGRAPHER"
"THE YEARS THAT HAVE PASSED "

"A MAN FROM HOME"
"BETWEEN PUFFS"

By C. CROWTHER
KOBE, JAPAN

BUILDING A SUCCESSFUL STUDIO BUSINESS

PROBABLY photography was never so prosperous as it is today—not even in the much-vaunted past, when single prints fetched several dollars. And yet, however much good times are in evidence, there are—must be—always some who feel the stringency of things. A photographic editor is ever receiving letters from readers who have not been able to find the key to success, and naturally they think there is a fault or a miss somewhere, and that it is not in themselves. To a certain extent they are—some of them—right. There may be local circumstances which tell against a man, just so surely as in other cases the conditions are favorable.

“There is nothing succeeds like success,” but that is but added bitterness to the unsuccessful one. There are many men in small towns and villages who never get any money ahead, and who when hard times come find the hard times to be very real. Unfortunately (and it is a thing that an editor feels keenly when hopefully asked for advice) there is no easy way out of tight places. Energy is the only thing—or rather energy is the essential backing thing—which will work the miracle.

First, a word as to what is a “big” business. The word is one suggested by our correspondents rather than by ourselves, for it is a fact not always realized by them that the businesses they speak of so enviously are sometimes anything but big.

People are not unknown—even among those included in the magic words “Fifth Avenue photographers”—who employ as small a staff as many a struggling photographer whose assistants are limited to one or two members of his own family. The big business men are, many of them, never heard of outside their own cities. There are big businesses not only in New York, but in Boston, Philadelphia, Chicago, Pittsburgh, and other cities—businesses quite unknown, yet doing a turnover infinitely larger than that of many a well-known man. What is meant is what has been termed “individual” photographers:

(8)

those who have made their business by a strong personality in the photographic end as much as in the business end. Now, to speak of the big business for a moment, we have said that many of the biggest are the least known. They usually owe their position to two things—capital and energy. In their own cities they are quietly and consistently pushing after business. Even if they never go for general publicity in newspaper columns they may, none the less, be working in those circles from which they can reasonably expect to draw custom.

But the general run of photographer does not taste the advantages of capital. And it is from this general run, which furnishes those who write inquiringly to an editor, that the successful men are drawn; and it is this fact of having been “through the mill” that ever makes them ready to tell what they can toward helping others along; and it is because their example may be followed by those who are not blessed with capital that editors describe their work and their methods.

There is nothing occult or mysterious in a large city; some workers seem to think that the larger the city the more chance there must be to find an unoccupied niche. If there is any choice in such matters, probably it is against, rather than in favor of, the large city. It may at least be said that the proper place to commence the road to success is where a man now is. The successful man usually changes because he has *outgrown* a place, not because it has starved him out. He makes his success up to the limit of the place's possibilities before he reaches after the larger.

The difference is not so much between big and little business as between successful and unsuccessful ones. It is very difficult for the unsuccessful man to grasp this. He dreams that the other man has better lenses or more equipment, a capable operator or a new style of skylight. These imaginations are often wide of the mark, and the success is but the logical outcome of hard thought

and hard work—backed by an aggressive business energy.

There is one hard fact which should be grasped by everyone who wants to get among the successful businesses, and that is that things were never as prosperous as they are now, and may never, in our lifetime, be more prosperous. The deduction is that right now is the time to start ahead; there must be no waiting till harvest is over or until the winter season commences; there must be no waiting "for something to turn up."

How is the progress to be commenced? That depends on individual conditions; but one thing is a primary certainty, the work must be good—work that will appeal to people as being good, and draw repeat orders and new customers. The work must be put before the people. This means advertising in every way that seems to be suited to local conditions. Advertising, remember, is not *merely* a matter of spending money for printer's ink. Much advertising, both in newspapers and circulars, is so much money wasted, because the advertiser has not thought out the wording of his announcement. And sometimes an advertisement may be obtained without the cost of a penny if a man is wide-awake and alert. Good business management is a necessity—and many photographers are bad business men. All have felt, at some time or another, the shortcomings of assistants. But few realize that there may be similar—or other—shortcomings in themselves. There is a tremendous drain of waste

in many businesses—plates needlessly exposed, spoilt prints, overpersuasion when the drummer calls, leading to overstocking. When the work is right then prices should go to a self-respecting figure. And everything should be done to *deserve* success.

"But," it may be said, "everybody cannot reach the top." That is true; but still there is always room a little ahead for the man who likes to climb up to it. We have too few leaders—the more the better, for themselves and for photography. And there is another aspect of the case which should not be lost sight of. The reward of the successful man is not solely a money one; there is a very real satisfaction in the mere producing of good work, and the more the work improves the greater is the craftsman's delight in it. And congenial work is a very pleasant thing. There may be such a thing as very much improved work and very little improved income. We meet many men, and have more correspondents, and among them we know not a few who are chafing against very circumscribed surroundings and looking in vain for the larger field. Still, even in these cases, the time has been well spent, and the photographer's pleasure in his work has been enhanced—chronic growling has been changed to divine discontent. But this is seldom finality; the discontent is a necessary stage in the step to a wider field; and sooner or later, in some of the cases, the opportunity will come—or be made—and there will, from time to time, be new names added to the "men that are."

VERY RAPID DEVELOPER. Those who are fairly confident of the correctness of their exposures should give a trial to the one-minute development method of Joannovich. Two solutions are prepared as follows:

A	
Water	50 ozs.
Sodium sulphite	5 ozs.
Metol	$\frac{1}{4}$ oz.
Hydroquinone	$\frac{1}{4}$ oz.
B	
Water	50 ozs.
Potassium carbonate	5 ozs.

Solution A is placed in a developing tank, and a rack of plates immersed in it for thirty seconds, motion being given the rack to avoid bubbles. The plates are then removed and immersed in a tank filled with solution B for thirty seconds, and are next rinsed in water and transferred to the fixing bath. A single plate should be experimented with first, as the method is a very drastic one.

ON BACKGROUNDS¹

By SADAKICHI HARTMANN

(SIDNEY ALLAN)

SIR JOSHUA REYNOLDS is often quoted as having said that the background is the most important and difficult part of a portrait. This is, no doubt, a slight exaggeration. The rendering of the face and figure is, after all, the principal thing.

But nobody will deny the difficulty of making a background simple and unobtrusive, and yet effective, so that it will form an harmonious part of the picture and show the head and figure in a way that one gets the impression as if they were surrounded by space and atmosphere.

There are really only three kinds of backgrounds: First, the simple, plain background, which consists merely of a differentiation of values, a gradation from black to white. Second, the artificially arranged or studio background, that deals with accessories and introduces lines and forms into the play of light and shade. And third, the home portraiture background, which tries to make the best of the momentary environment.

I shall deal largely with the first, because it reveals the fundamental principles that underlie the making of a background better than either of the other two. The same laws that apply to the plain background also apply, with few modifications, to the studio and home portraiture backgrounds.

At the very start I must confess that there are no distinct rules to go by. In the profile and three-quarter view I was able to assert that such and such a view was the most favorable one. It is impossible to do this with backgrounds. They depend too much on the complexion of the face; on the color and form of the hair, headgear, and wearing apparel; on the particular silhouette the sitters make against the space behind them, and the general arrangement of

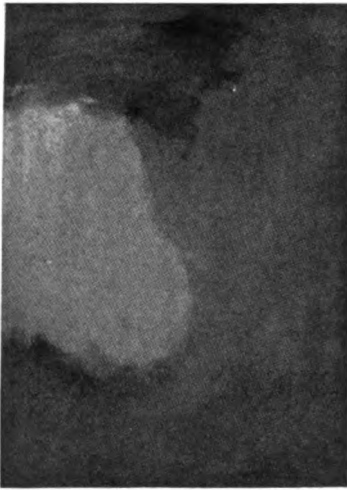
lines and light and shade of the composition. It is a new problem in each instance.

There are, however, a few background arrangements that are typical, as they have been in use ever since portraits were made. I have tried to reduce them to the eight forms shown in the diagrams. Of course, the light spot in Diagram 1 could just as well occur on the right side, and all the various arrangements could be entirely reversed; that is, for instance, in Diagrams 3 and 4 the light part could be dark, and *vice versa*.

A background (excepting those of absolute monotone tints) always consists of two masses, one lighter than the other. The lighter one is generally the smaller. The separation of the two masses is produced merely by a juxtaposition of tints; one feels that they are separated, but one cannot say where either ends; they glide into each other by the means of more or less subtle gradations. At times they may look like a mere jumble of black and white, all mixed up in their planes, but even then one should be able to trace vague shapes of light and darker masses. It is always the same struggle between light and darkness. The all-dark or all-light background (one single tone without differentiation) is the simplest type. A plaster cast looks well against a solid black ground, and a bronze bust against a monotone tint, but it will never do in portraiture. The Secessionists and extreme tonalists have often fallen into that error. There must be somewhere some slight differentiation of values, some accidental light, some passing shimmer, some apparently meaningless spots or accents, or the surface will look dead and the figure as if pasted on the background (if the latter is light) or entirely lost in the background (if dark).

A narrow strip (Diagram 5), either

¹ From "Composition in Portraiture."
(10)



1



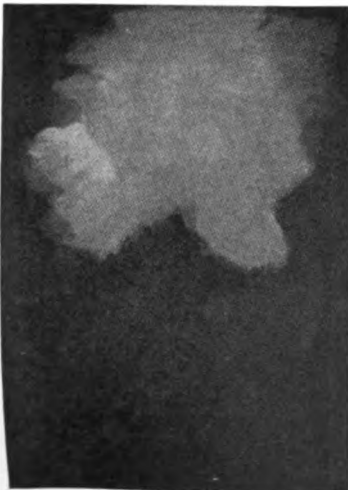
2

darker or lighter than the remainder of the ground, along the top or bottom of the picture (and for that matter also along either of the upright sides), is often used effectively. It looks rather bold, yet furnishes an accent and helps the background to recede in the picture and to suggest space behind the figure.

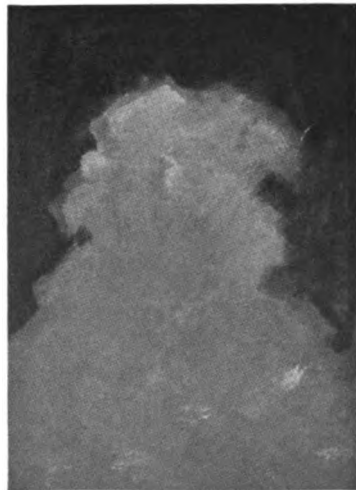
The most popular form of a background is shown in Diagram 1. We all know it. I venture to say that 75 per cent. of all background arrangements are made on that principle, *i. e.*, to show

the lighted part of the face against a middle tint plane and to surround the head with more or less darker planes. A variation of this principle is shown in the Mrs. Simpson, of Raeburn. The strongest highlights in the figure occur in this instance in the side that is ordinarily shown in shadow. The result is a stronger contrast against the dark planes of the background.

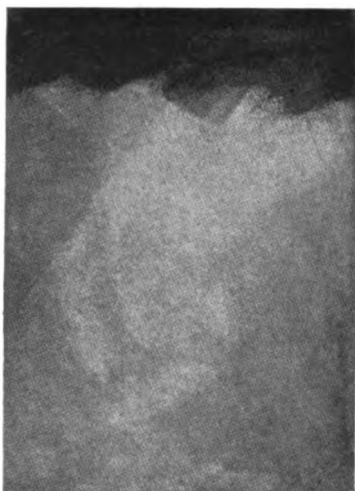
Diagrams 3 and 4 show backgrounds that were extensively used by the English portrait painters. They have been so much tried successfully that



3



4



5



6

they cannot help being effective. In Dührkoop's portrait we have the arrangement of Diagram 3, and in Watts' "Lady Gervagh" and Raeburn's "Colonel Scott" the reverse of the same. Any art magazine or illustrated history of art will prove the popularity of these two forms of background. Diagram 6 is particularly suitable for decorative work or when the head is small and you want a similar effect on both sides of the figure.

The arrangement in Diagram 2 is capable of the most artistic effects. It

was applied with preference by the Dutch portrait painters. The idea is that the light spot is a trifle larger than the head of the sitter. This will allow slight patches of light on both sides of the head. If you place the lighted part of the face against the darker part of the background, you have the famous Rembrandt effect. The Rubens self-portrait is composed on that principle. Of course, no picture reproduced here carries out exactly the shape and values of the black-and-white arrangements of my diagrams. I merely have endeav-



7



8



BURNE-JONES
BY F. HOLLYER

LADY GARAGH
BY WATTS

SELF-PORTRAIT
BY RUBENS

MISS SIMPSON
BY RAE BURN

COLONEL SCOTT
BY RAE BURN

ored to come down to typical forms that are the basis of subtler and more elaborate arrangements. If half a dozen pages were put at my disposal for the reproduction of paintings, I could absolutely prove to you the correctness of my theories. As it is, I can merely make some suggestions and leave the remainder to your investigation. We ought never to forget that composition cannot be taught like a language. After all, we only know and appreciate such ideas and facts as we have gathered from our own observations and experience.

In Diagrams 7 and 8 I show you two backgrounds that are frequently applied by modern portrait painters for standing

figures. Whistler, Chase, and many others seem to be particularly fond of the arrangement in Diagram 7. If the floor is lighter than the rest, the result is a distinct contrast between foreground and background. It helps to suggest actual space the picture gives in prospective depth, and the figure is enveloped, as it were, in vibrating air. Diagram 8 is simpler and shows merely that if the floor is as dark as the space behind the figure, a lighter spot must occur somewhere to break the monotony of the background composition.

As for the background with accessories, it seems that the old masters carefully avoided them in their por-



PORTRAIT OF AN ADMIRAL
BY FRANZ HALS

MY MOTHER
BY L. MICHALEK

PORTRAIT
BY R. DÜHRKOOP

DUSÉ AND MARION LENBACH
BY FRANZ VON LENBACH

traits whenever they could. A background should be simple first of all. They were, however, fond of vertical lines, and frequently introduced an open window in one corner of the picture. This suggested an interior, and as the space occupied by the window and the landscape outside was invariably in a lighter key than the rest of the background, it helped the chiaroscuro part of the composition. The Dutch masters, striving for more picturesqueness, did not hesitate to put the window right behind the head of the sitter, as in the "Portrait of an Admiral," by Franz Hals. But if you study it carefully you will realize that

it merely is a version of the arrangement in Diagram 4. And in all the elaborate landscape and curtain and column arrangements of the English portraitists you will find the same. It can always be traced to the contrast of dark and light planes, and the juxtaposition of black and white in spots and masses.

The old window idea, reduced to a vertical line division of dark and lighter planes, is cleverly used by modern portraitists. A good example is Hollyer's portrait of Burne Jones.

The home portraiture background will always look a trifle amateurish unless superior knowledge of composi-

tion is applied. I fear the depiction of an interior like Michalek's "My Mother" is photographically an impossibility.

The plain background is always to be preferred. The sketchy background, as applied, for instance, by Lenbach (which still belongs to this category), opens up new possibilities. A few scratches and daubed-in accents are apparently all. And yet, as unimportant as these technical details may seem at the first glance, they lend virility, variety, and comprehensiveness to the total effect. With their help an otherwise dead surface becomes animated, the silent begins to speak, and the dull turns colorful.

But only a trained artist can do it, and it is largely a matter of temperament.

The trouble with the painted-in backgrounds that have lately become so fashionable in photography is that they are not made by trained artists. They are merely indifferent imitations of the backgrounds of well-known paintings, and often in no light relation whatever to the subject depicted.

It is probably hardly necessary for me to say that the silhouetted and air-brush backgrounds are no backgrounds at all, artistically speaking. They may have their commercial value, but no pictorial pretensions whatsoever. They are in as bad taste as the carved arm chair, potted palm, and *papier maché* column of former periods.

The simple, plain background will win out. It is the most normal and dignified of backgrounds. I still may add that the lighter a background is the more cheerful and pleasant it will look, while a dark background will suggest depth and be sure of a more serious and dignified effect. The vaguer the differentiation of values the more refined and elegant an impression the background will give; on the other hand, if you strive for brilliancy, the contrasts between dark and light must be more pronounced.

Yet remember that it will be a new problem with every sitter, with every pose, and for that reason, if for no other, it is well to speculate in a few of the most typical forms, as I have endeavored to do in this chapter.

OUTSIDE TRADE

By C. H. CLAUDY

IF you haven't any, there is only one place to put the blame.

There is always an outside trade for every business. If the man who runs the business doesn't get it, some other fellow will.

These things being so, isn't it up to you, who naturally want to make all the money you can, to go after a little outside business?

Let it be understood right from the start that I am not attempting to tell you that you should try to cabbage the commercial trade from your commercial competitor, unless you are strong on that sort of work. But there is a great deal of trade belonging to you, and not

to him, which he gets because you don't know enough to make it known that you want it. A commercial photographer, whose business it is to make landscapes and buildings and machinery and pet dogs and newspaper pictures, and a few other varieties, is not going to turn down an opportunity to make a portrait, but some such portraits, made under what are, at best, poor portrait conditions, are sights for the gods who oversee the mistakes of mankind.

If you know how to make a portrait under your light, you should know how to make one elsewhere. It isn't at all a safe gamble that you do, but if you know the principles, as well as the

practice of portrait lighting and making, you will succeed as well in the home as in the studio, albeit with more trouble.

Now, suppose you try advertising the fact that you make portraits at home. Try something like this:

Let the Studio Come to You

If you cannot come to 999 Main Street to be photographed, I will bring the studio to your home.

I can make you a "home portrait" or I can make you a portrait in your home that is in every way the same as my gallery work.

SMITH, *Photographer.*

Put it in the paper. Put it in several times—the announcement, not the same wording—and see if you don't get plenty of replies. There are old people, and bedridden people, and sick people, and children and babies, and lazy people, and rich people, and people who want something new, and people who want to talk about something different! There are a lot of home portraitists traveling around the country and getting good prices for good work, and I don't see why they have to be out-of-town people to get the trade of your town!

Here is another card, just by way of suggestion:

Your Picture in Your Home

You *cannot* bring your home to my gallery, but I *can* bring the essentials of my gallery to your home. Your portrait in the surroundings your friends know is something they will cherish.

The price is *not* high—ask me.

SMITH, *Photographer.*

Now agree with me, for the sake of argument, that you have orders for home work. How are you going to go about it? To transport your heavy screens and camera to a house is absurd. You have got to have some special rig to carry. Speaking from experience, I can assure you—and the best and biggest of home-portrait men will uphold the statement—you don't need half the things you will think you want.

You must have a camera and a lens. Make it a light view camera, your portrait lens and shutter.

You must have a background. You will have to have it because some people won't want a home background;

but, because you won't need it all the time, it is foolish to carry a lot, and heavy ones at that. Get a piece of dark red and light gray stuff, have them sewed back to back, put hooks on one edge, get some picture wire and two bradawls, and you are equipped. Roll it, don't fold it. You have thus two portable backgrounds, hooks to hang it upon, wire, and bradawls to stick in the top of door frames and window frames, where the hole won't show, and to which you attach the wire.

You will want a reflector. I suppose nothing less than a wire ring and stand will do you; but if you can manage with it—as many a man does—a collapsible frame of light wood and a small piece of sheeting, the whole to be supported on a chair, is all that you need.

Finally, a small hammer, some tiny tacks, and plenty of cheesecloth, and you are equipped to turn any room into a studio. If you cannot learn to so modify a window light with cheesecloth and reflector that you are enabled to make a first-class lighting, you had better keep out of the business; but just remember this, lots of men do it, and what others can do and have done you should be able to do also.

Because you will find people less critical of home work than gallery work is the poorest excuse in the world for doing work you would not let out of your gallery. The very amateurish amateur has set his ineradicable stamp on "home portraits," and your average customer will expect a soot and white-wash portrait, with ink for the shadow side, and be so pleasantly disappointed when she doesn't get it that she will overlook other shortcomings. But that is no excuse for making them, and you want to remember that there are others to see that picture, and critical others at that.

I should strongly advise your study of a book on composition. You have simply got to have some knowledge of line and composition and balance if you are going to make a success of making portraits with a background of reality, instead of the Stygian blackness or smoky cloudiness which your studio

background allows you to use to hide possible errors of composition. Your patron may not know a plane from a pipestem, or realize at all the difference between a well-balanced picture and one that is toppling over into an abyss—may not know that lines lead and carry, or that there is a way into and a way out of any picture which is properly made; but some one with critical judgment is going to know, even if they cannot put a name to it, when your picture is incorrect, and so you will suffer in the end.

You will find, of home portraits, the easiest to make are those which require but the head and shoulders. Unless you are a double-dyed-in-the-wool, a yard wide, and warranted fast-color home portraitist, you want to watch with an eagle eye, lest you attempt to make a head and shoulders with a "home" background. For that way lies the easy road to failure. It takes a pretty level head and a pretty good artist to put a large head and shoulders against anything but a plain and innocuous background, and unless you are sure of what you are doing, stick to plain ones. By plain backgrounds it is not meant that the surface of the cloth must show no design. One of the most effective and appealing pictures I ever remember seeing, made in a home, was of an angel-faced child, by Pierce, of Boston, in which an old shawl, with a subdued pattern, was used as a background. But here, again, is a pitfall. Beware of it! A pattern in a background must never intrude—it must tone in, be a part—not stand out and seem to be that plane of which the face and shoulders are a part.

The most effective home portraits are those pitched in a low key—this does not mean a small range of deep shadows, where the contrast is small. I cannot pretend to state why these pictures enjoy so much popularity, unless it is that one naturally expects the opposite from much suffering at the hands of the amateur beginner and his steep mountains of contrast.

In portraits in the home, with the home background, watch carefully for the obtrusive background. You are

not making a picture of a bookcase, or a desk, or a sideboard, or a chair, or a mantelpiece, or a fireplace. You are making a portrait of a person, and you are going to suggest their location and habitation—not shout it from the picture. You will have to learn something of the use of stops in separating planes, and learn that there is a degree of indistinctness which is pleasing, and a further degree which is inadmissible, and govern your lens opening accordingly.

I would warn you against the too conventional pose. Milady reading a magazine by a lamp, which you "artistically" light up in the retoucher's room, may be a masterpiece, but it is much more apt to give a real artist a pain. Grandpa, dreaming over an open fire, made with a newspaper and frantic adjurations on your part to "sit very still—don't move—through in a minute," may please the brominic person, but will set you forever beyond the pale of the truly elect. I would suggest your standing in prayerful contemplation before—well, Whistler's "Portrait of His Mother," for an understanding of what simplicity may mean in a picture in the home.

Now there is the question of price. It seems to me that I should do one of two things, were I attempting to work up such a trade. I should either charge a high price for the single picture and a reasonable one for the dozen, or I should charge so high a price, single or by the dozen, that people would not want very many. Both courses have something to recommend them, and it largely depends on the kind of town and class of trade you have. On the whole, I incline to a reasonable charge by the dozen or half dozen, but a stiff price for the single picture. There is too little profit in the single picture, at anything less than a stiff price, to make it worth while. On the other hand, if people want a single unique picture, as they have been known to do, the stiff price goes without question.

But making a dozen at home at but a small increase over gallery charges gives you a beautiful chance to advertise that your price is not high—and, if you have

the time, or can hire a good man to do such work, you can well afford to make three or four "sittings" at home in a day—or in a week—at a price not greater than one-third more than your regular gallery price for the same size picture—always providing that your gallery does a reasonably high class of trade. If you are making cabinets at \$10 the dozen, you can make them at home for \$12.50—certainly for \$15. If you can get \$18 in the studio for an 8 x 10, you should be able to make it

\$24 to \$30 in the home. Many home portraitists would hoot at such prices—they get from \$5 to \$10 per single picture, and it is exactly in this terrific price that your opportunity lies. They could hardly do it for less, and live—doing that exclusively. With you it is, as it were, a side line, and gives you an opportunity for extra money which should be all to the good, even if done at a moderate profit—a profit you could not live upon were it your sole source of income.

MASTERS IN PORTRAITURE—REMBRANDT

OF all artists, Rembrandt van Rhyn is perhaps the one that is most dear to the Anglo-Saxon mind. Like Shakespeare's dramas, his paintings represent to us one of the great art expressions of all times. It is difficult to classify him, he was so universal and proficient in all the various phases of his art. Although no idealist in his personal expression, he understood how to imbue every object with a deep spirituality, and it is this spirituality which appeals to art lovers even more strongly than his wizard-like technique and profound knowledge of life.

His portraits have the same characteristics as his larger compositions. He represents the soul-life of people. They become alive under the magical touch of his brush. Technically this was brought about by the wonderfully accurate reproduction of outward appearances and his mastery of chiar-oscuro problems. The expression of light and shade became to him the vehicle of both imagination and emotion. Deprive Fig. 4 (the portrait of his wife, Sasikia, as a young girl) of the peculiar light effect, much that can be admired will still remain; but the principal charm, the finest essence, the soul of the picture will be gone.

For years the art world has made use of the term Rembrandt lighting. I think it is largely a misapplication. Rembrandt was so versatile in his

light and shade improvisations that it would be difficult to express it by one pattern. Rembrandt lighting was considered a system of lighting in which the lighted side of the face was opposed to a dark background, and the shadow side opposed to a light background. Now, study the twelve accompanying pictures, twelve masterpieces of portraiture; you will not find a single one where this scheme is exactly carried out. There is a frequent juxtaposition of light and dark, but it is generally a lighted cheek against a profusion of dark hair. Fig. 1, perhaps, comes the nearest to it. There we see a streak of vivid light along the upper arm on the shadow side of the picture; but the other side of the background is almost equally bright. In Figs. 2, 5, 6, and 10, we have a similar scheme. He apparently had a special preference for lighting up the opaqueness of the shadow side with a glimmer of light; but we do not notice it in Figs. 4, 9, and 11. In Figs. 6 and 12 the lighting comes more from the front, but the treatment of the background is very much the same as in Fig. 7.

We notice, however, that the painter was very fond of contrast, and strong contrasts are naturally best produced by a juxtaposition of light and dark, and he used this device most effectively in the majority of his portraits. I will even give in that it became a mannerism with him; but he invariably



1. PORTRAIT OF HIMSELF
2. SASIKIA

3. PORTRAIT OF A MAN
4. REMBRANDT'S WIFE

followed the whims of the moment, the dictation of his eye, which by long experience knew where an accidental touch or shimmer would add to the picturesqueness of the composition. It never became with him a stereotype system that had to be carried out at every instant. And that is where his imitators fail, and we surely pay no tribute to the painter's genius if we consider every crude adaptation of his style a work of artistic merit.

It seems to me that his light-and-shade composition was guided largely by the costume of his time. Men wore wide-brimmed hats, very much like ladies do nowadays, and so he used them to best advantage (*vide* Figs. 1,

5, and 7) by having the brim shade the forehead and eyes, showing the latter through translucent darkness in subdued brilliancy. With him light had to illumine every nook and corner. He wanted no complete darkness, no opaqueness—everything had to vibrate with air and reflected light.

The costume itself was picturesque at that period. Men still wore armor, chains, and embroidered knee-breeches. No painter has ever made use of accessories in such a beautiful and convincing manner. Everything that was unnecessary he eliminated—drowned it, as it were, in transparent shadows and one dominating tonality—but any object that was beautiful in itself, as a chain,



5. PORTRAIT OF HIMSELF
6. PORTRAIT OF A MAN

7. PORTRAIT OF HIMSELF
8. JOHN SOBIESKI

a ribbon, or a piece of gold or silver lace, he would depict in vague outlines, preserving the form by dozens of high-lights and thereby producing quaint designs that would embellish the large dark planes that we invariably find in his bust portraits.

Fig. 4 looks as if it were painted in candlelight or the light of a lantern. The source of light was very near the face, or the dividing line of light and dark could not be so sharp on the lower part of the bust. But the effect is startling—poetically beautiful at the same time—and that is no doubt what

the painter wanted. As I have said at the very start, light was to him the great spiritualizer. It brought out unforeseen beauties. The face became animated as with an inner light.

Some of the light schemes are more ordinary, Figs. 2, 3, 10, and 12, for instance; but the division of light and dark planes is always masterly. Rembrandt did not model his faces by subtle values, but by strong contrasts. Why did he depict the "Man with the Copper-colored Nose" (Fig. 9) in an even light? Because the man is old; his face shows too many wrinkles;



9. MAN WITH COPPER-COLORED NOSE
10. PORTRAIT OF AN OLD WOMAN

11. PORTRAIT OF A RABBI
12. PORTRAIT OF A LADY

there would be too profuse a differentiation of small light and dark planes in any other light. The very contrast he made use of consisted of the juxtaposition of the white beard and the uniform middle tint of the upper part of the face. This is a wonderful lesson, and nearly everyone of his pictures can teach us an equally valuable one.

In Fig. 11 we notice that as soon as there are other objects of interest besides the face (as the hands, turban, and various ornaments in this picture), the lighting of the face becomes less strong—the face must produce its effect as a large plane and not by a variety of minor contrasts. In Fig. 10, hands,

cap, and collar are all light, so he used more forceful drawing, but did not accentuate the high-lights and shadows. If he had done so, the face would have lost in importance.

Also much information can be gained by studying the arrangement of the general outline against the background. Figs. 1 and 3 are rather indifferent. A three-quarter view in an oval never looks as well as a symmetrical front view; but Figs. 6, 7, and 8 are excellent in that respect. Notice how the feathers and brim of the hat have been utilized in Fig. 7, and the contour of the hair in Fig. 6. In Fig. 5 the division of space is unsatisfactory. There is a confusion

of lines, and the face is too low in the picture. In Fig. 8 the outline is less clear than in Fig. 6 or 7. There is a reason for it. The costume of King Sobieski is so gorgeous, and there are so many objects of interest, that a clear contour would make us feel them too much; there would be too many lines, and the face would no longer be of sufficient importance to control and balance the other objects.

In Figs. 2 and 4 we have the suppressed outline. It is partly lost in the background. Rembrandt seemed to favor this arrangement in his representations of women. It lends more

mystery to their form and permits of a subtler concentration of light. The illumination of Fig. 2 as well as Fig. 4 would be impossible to Fig. 12. Either the outline had to be blurred into the background or the background made considerably lighter in parts.

Thus, every one of Rembrandt's portraits offers opportunity for speculation. "How would it be if this were different?" or, "Why did he treat it in this way and not otherwise?" could be asked in every instance. And by trying to answer these questions we become acquainted with the intricate mechanism of composition.

MISTAKES REGARDING FOCAL LENGTHS AND LENS STOPS

By F. C. LAMBERT, F.R.P.S.

FOR many years past it has been my pleasant and interesting duty to deal with a very large number of queries from beginners and others. Two of the topics which turn up with almost mechanical regularity are how to measure the focal length of a lens and how to measure the f / v values of stops.

For very rough-and-ready purposes it suffices to focus the lens on any distant object, measure the distance from the ground glass or image plane to the stop, and call this the focal length. Also, if this rough-and-ready focal length be divided into portions, each precisely equal to the diameter of a stop, we get the f / v value of that stop by taking the number of times the stop diameter divides into the focal length.

Once again be it said there are rough-and-ready methods often "near enough," but they are not correct at all and may be considerably "out."

Only a few days ago a querist wrote: "I have just bought for £10 a lens by A. B., stated to be 8 inches focus and working at f / 6.5 ; but on focusing for a distant object I find the image-to-stop distance is nearer 9 than 8 inches,

and dividing this distance by the diameter of the largest stop it comes nearer 8 than 6, etc." I have no doubt whatever that this lens issued by a firm of front-rank repute was all that it was said to be, and that the faults imagined were due to defective procedure on the part of my querist.

Accuracy is very generally thought to be the same thing as immense trouble and skill. For a very high degree of accuracy often great care is required, but for a practical degree of accuracy this is by no means always the case, as I shall proceed to show in the case of measuring focal lengths and stops.

Let us divide our work into two steps: First as regards focal length, second as regards stops.

We need one or two very simple, easily made bits of apparatus. First of all we take a strip of paper or card, 1 inch wide and, say, 12 inches long, and mark it off accurately into inches and tenths. (See Fig. 1.) Also, we want a flat, wide cork, *e. g.*, out of a pyro bottle. Next a long French or wire nail. The nail is thrust through the cork exactly at its centre and

pushed home so that the nail and cork will stand firmly on their heads. (See Fig. 2.)

Now we take an empty plate box and, holding this with the long side edgewise flat on the table, we fix a post-card to its vertical edge by a couple of touches of any adhesive, *e. g.*, gum, seccolene, office paste, or sealing wax.

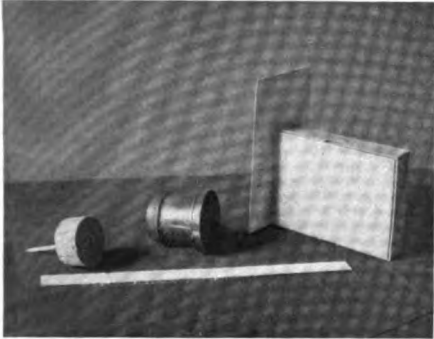


FIG. 1

In Fig. 1 we have the card scale, cork and nail lens rest, the lens, and the post-card focusing screen.

We now open a window giving on some distant view or object. Then going to that side or end of the room opposite the open window we put a small table.

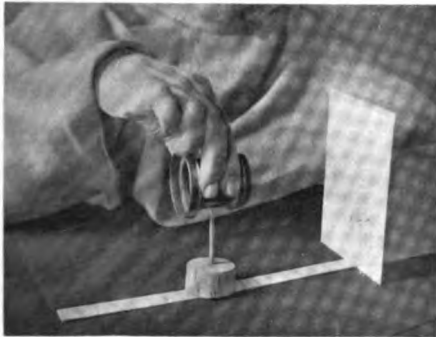


FIG. 2

Then placing our post-card focusing screen facing the window and view beyond (Fig. 2), we then put one end of the inch scale touching the post-card, rest the cork and nail on the card scale, and rest the lens on the nail point at such a position as gives us a sharp picture (image) on the post-card.

Having got good definition with the lens held horizontally between thumb and fingers (Fig. 2), we give the lens a slight twist to the right or to the left, keeping it horizontal all the time, closely watching the image on the card screen. If the image moves when the lens is rotated sideways on the nail-point support, then the nail is not supporting the lens at the right place. Note this: *If the image moves the same way that the lens end next the image moves, the nail is too far away from the image. If the image moves in the opposite way to the swing of the lens, the nail is too near the image.*

Having found that point of support of the lens which enables the lens to be rotated sideways without producing a change of the position of the image, we then measure the distance between the point of the nail and the post-card, or image plane. This we easily do with the aid of the card scale, and so we get the true focal length of the lens.

It will thus be apparent that while measuring the focal length from the position of the stop is often "near enough," it is not sufficiently accurate for all purposes. (At times, though somewhat rarely, the stop happens to coincide with the posterior nodal plane or Gauss plane.)

If the lens be reversed and the above process repeated we shall then find its anterior nodal or Gauss plane. The two nodal planes may be but seldom are coincident. They are usually an appreciable distance apart. Having found the posterior nodal plane it will be useful to mark the lens tube so that this plane may be easily found for other measurements, of which more anon.

Measuring the $f/$ Value of a Stop

The true $f/$ value of a stop is found by dividing the focal length by the diameter of the cylinder or pencil of light *entering the lens*.

In the case of a single lens with a stop in *front* of the lens, then the diameter of the stop measures its entrant pencil or cylinder or beam of light. But where the stop is *behind* the lens, then the diameter of the stop is smaller than

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the entrant cylinder. Hence, in this case, if we take the diameter of the stop and divide this into the focal length we should get a stop number too large. By way of example, suppose the focal length to be 6 inches, and the diameter of the stop to be $\frac{3}{4}$ inch. Then 6 divided by $\frac{3}{4}$ is $f/8$. But let us suppose that this stop (behind the lens) admits a cylinder of light of 1 inch diameter, then the true value of that stop would be $f/6$.

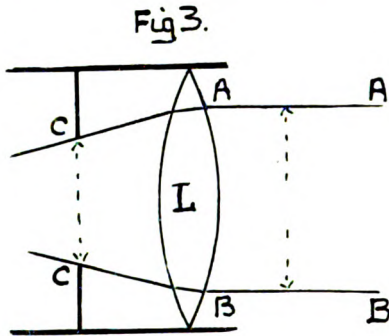


Fig. 3 will give the drift of the idea as to how the lens L acts as a condenser of the parallel beam bounded by AA and BB , so that it passes through the stop CC .¹

Now let us return to our homely experiments. We take an unmounted biconcave lens and support its edges on a couple of equal-sized corks about $1\frac{1}{4}$ inches long, and then under the lens on the table supporting the corks we place a foot-rule and look straight down on the arrangement and see something like Fig. 4.

We at once see that the lens magnifies the width of the foot-rule and also the apparent size of an inch. To make matters clearer I have indicated by short lines where the inch marks come along the rules.

We now replace the foot-rule by one with ivory edge marked in $\frac{1}{4}$ inches, and under the lens we place a halfpenny and two other halfpennies beyond the lens for comparison. Remembering that this coin is just an inch in diameter, we note that its width agrees with four of the quarter-inch marks on the ivory edge. Thus we see that an inch stop behind the lens is equivalent

to something more than an inch on the outside face of the lens. For it is this apparent lens-face-value of the stop that we want to get at. In Fig. 5 the proportion of the lens-face-value to the actual size of the coin is about as 4 is to 3.

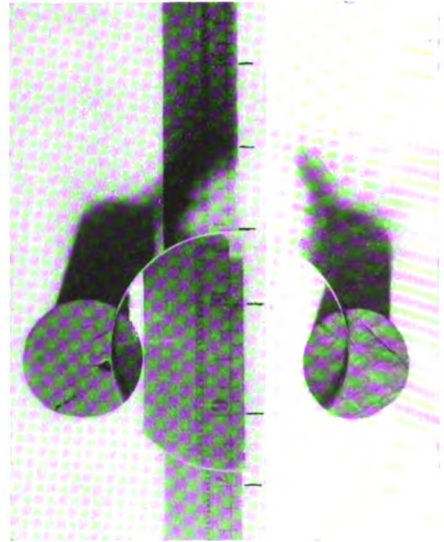


FIG. 4

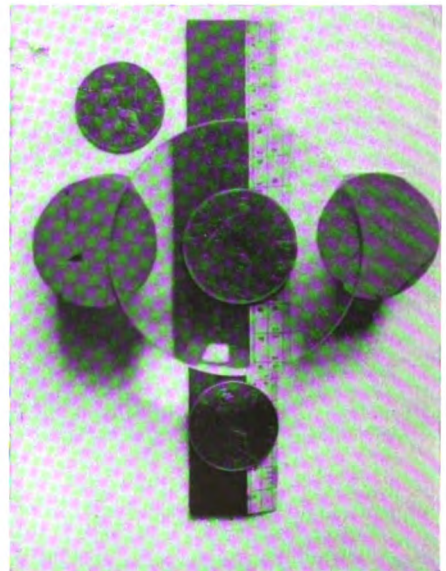


FIG. 5

Now we find that as we move the eye about from side to side along the lens so does the margin of the coin shift

about. But to get the true value we have to view the margins along lines parallel to the axis of the lens. This is easily done with the aid of a bit of card on which we have ruled a number of fine black ink lines just $\frac{1}{10}$ inch apart. This card is then bent in such a way that the bending fold or crease is perpendicular to the ruled lines.



FIG. 6

In Fig. 6, to the extreme left, I show such a card ruled and creased so as to bring the two parts at about a right angle with each other. In the same illustration a second similar card is laid across the hood of a lens whose stops are to be measured. The crease should coincide in position with the diameter of the stops and lens hood.

On looking down along the lines nearly vertical to the planes of the lens we can arrange matters so that one line agrees

precisely with one end of the apparent diameter of the stop and then count the lines to the opposite margin and estimate to a half or quarter tenth, if need be, the width of the stop diameter.

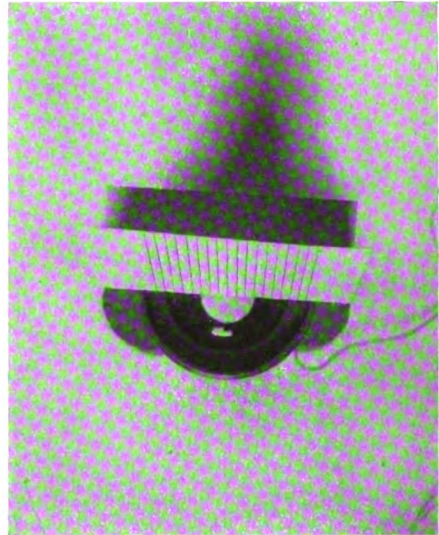


FIG. 7

In the figure the apparent lens face diameter of the stop is six-tenths of an inch. Suppose the focal length of the lens to be 6.8 inches; dividing 6.8 by .6 we get 11.33 or the true $f/$ value of the stop. In reading the width of a stop the eye must look straight along a line pointing to the edge of the stop, or midway or quarter way, as the case may be.

METHODS

INTENSIFYING BROMIDE PRINTS. A good method of intensifying bromide prints was recorded some time back in the circular published by the Manchester Amateur Photographic Society. It is well worth repeating in these dull days of bromide work, for although it rarely repays one to fiddle with a spoilt small print, an enlargement is certainly worth an attempt to save it. Ten grains each of copper sulphate and potassium bromide are dissolved in each ounce of

water for the bleaching solution, and the print, after treatment with this bath, is well washed for five minutes and then redeveloped. If it be flat from too long exposure, a mixture of 50 drops of rodinal in 3 ounces of water is recommended for the redevelopment; while if it be flat from underdevelopment, 50 drops of a 10 per cent. solution of silver nitrate in 3 ounces of water is used. The print is well washed before finally being dried.



Greeting

WE wish all our readers a happier and more prosperous New Year. Have your studio *look* prosperous, think and talk prosperity, and keep your eyes wide open on what the successful men are doing, and *you* will advance.

We desire to make the JOURNAL of still greater practical value to every reader—to have a magazine every photographer will be proud of. While it is most gratifying to us to see the increasing recognition and influence the JOURNAL is gaining, we mean during the coming year to make a better magazine, and we ask your coöperation. Let us hear from you if we can be of any service, and our entire staff of experts and all our facilities will be at your disposal. We want the PHOTOGRAPHIC JOURNAL OF AMERICA to be a live, up-to-date, practical medium for the uplift and benefit of every photographer in the land.

Mr. Herford T. Cowling Returns from Tour

MR. HERFORD T. COWLING, chief photographer of the U. S. Reclamation Service, Interior Department, has returned from a photographic tour of the West, where he was engaged in making moving pictures during the last six months. Mr. Cowling traveled about 37,000 miles and exposed over 50,000 feet of motion-picture film as well as a large number of still-life pictures.

The films taken were for the most part scenic, and were made to be used by the U. S. Forest Service in showing recreational uses of our national forests and to induce the public to make greater use of our national forests as public playgrounds. Mr. Cowling spent a good portion of his time among the more primitive of our Southwest Indians living at the pueblos and picturing their domestic life. Films showing the harvest dances were made at several pueblos, and in some cases were the first time ever photographed with a moving-picture camera. The spectacular sun dance of the Taos Pueblo Indians on St. Geronimo Feast Day, September 29, was among the latter.

Many hundred feet of film were made descriptive of modern methods of irrigation on the

U. S. Reclamation Service projects, as well as the result of irrigation on the arid lands.

To secure some of the most thrilling of these films Mr. Cowling took many chances and occupied extremely dangerous positions. In one case he was lowered by a rope into the crevice of a mammoth glacier 300 feet deep. One of the most interesting films will show logging in the giant forests of Oregon and California, where the huge logs are skidded down the side of a mountain on chutes into the lakes at an enormous speed, while the most artistic films were made on the wonderful Columbia Highway of Oregon and at Lake Chelan in the heart of the Cascade Mountains, the most beautiful lake in this country.

These films will be used by Mr. C. J. Blanchard, statistician of the Interior Department, in his annual lectures throughout the East.

Photographer Cowling has made five such trips for the Department, securing educational films which are circulated through the schools and universities of the country by the Reclamation Service. Some of these films will be exhibited by Mr. Cowling this winter before the Federal Photographic Society, of which he is the president, when he will address the Society on the cinematographic art.

Mr. Cowling is now in the Washington Laboratory assembling these subjects.

A Correction

AN inaccuracy occurred in the specifications of the Ansco V-P No. 0 in Ansco Company's advertisement of this model in the December number. This camera is furnished with Actus shutter and Modico Anastigmat lens, F/7.5, at \$15, and with Extraspeed Bionic shutter and Ansco Anastigmat lens, F/6.3, at \$25.

Annual Exhibition of the Union Camera Club

THE Annual Exhibition of the B. Y. M. C. Union Camera Club, 48 Boylston Street, Boston, opened Wednesday evening, December 6, to the public and continued through Thursday and Friday evenings, December 7 and 8, from 6 to 9.30 o'clock, and Saturday, December 9, from 2 to 9 o'clock.

The collection of photographs was well worth a visit, and the prizes in many cases were taken by some of the newer members.

The awards:

Landscape: First prize, Arthur Hammond; second prize, T. Willis Cary.

Portrait: First prize, Arthur Hammond; second prize, Louis Astrella.

Marine: First prize, F. W. Hill; second prize, C. E. Dodge.

Genre: First prize, Chester Grille; second prize, Louis Astrella.

General: First prize, G. H. Seelig; second prize, Charles C. Wells.

The judges were: Frederick W. Horsman, Frederick W. Allen, and Florence Maynard.

The B. Y. M. C. Union Camera Club was organized in 1908 and has a membership of 75, mostly amateur photographers. The club quarters are well equipped with dark-rooms for developing, opportunities for printing, enlarging, and indoor photography. A social room and locker accommodation for members are also provided.

C. P. Goerz American Optical Company Increases Wages

THE C. P. Goerz American Optical Company has just announced to their office and factory staff a general increase in salaries and wages to take effect about December 15, 1916.

The reason given is the ever-increasing cost of living which the management feels should be compensated for as far as the rather adverse conditions under which the Goerz Company has to work on account of the war abroad will allow by a suitable increase in the earnings of their loyal employees. The proposed increase will add more than 10 per cent. to the present pay-roll of the Company.

The Sury Powder Process: A Pigmenting Process Suitable for Either Monochrome or Color Effects

THE paper is sensitized with ammonium bichromate and alcohol, 90°, or methylated spirit, two parts of the latter to three parts of the stock solution of the former. A 3 per cent. solution of ammonium bichromate strengthens the contrasts; a 4 or 5 per cent. is the normal solution, and a 6 or 8 per cent. diminishes the contrasts; 8 per cent. is the maximum to be used, and only when the negatives are over dense and the temperature of the room is under 55° F. The bath should be made at the moment it is needed, as it will not keep. A quarter of an ounce is sufficient for half-plate size. The edges of the paper are turned up by about a quarter of an inch on the four sides so as to form a sort of dish, and into this is poured the sensitizing solution. The paper is held by the two opposite corners, and the solution kept moving over it gently for two minutes, so that the whole surface is thoroughly moistened. The remaining liquid is then poured back into the glass and the paper hung up to dry. The process of drying takes place in a dark or almost dark room, and should not exceed one hour. If necessary, some slight artificial heat or ventilation may be made use of.

Artificial light has no influence on the sensitized paper, except the electric arc or the mercury vapor lamp, by either of which exposures can be quickly made. When dry the paper is very sensitive to daylight, and care must be exercised in handling it.

For printing, a special screen is placed between the negative and the paper. This screen gives both softness and transparency to the proofs. If the negative possesses few contrasts, its use can be dispensed with. A thin negative is most suitable. It is advisable to use a frame provided with strong springs. The deep shadows of the picture are sometimes slightly visible when the printing is finished, but it is safer to use an actinometer to ensure correct exposure.

Development should be carried out within two or three hours of exposure. The print is placed face downward in a dish of cold water for a quarter of an hour, changing the water five or six times. Then it is removed to warm water of 96° to 98° F. for two minutes, the dish being rocked now and again to ensure equal action. Mr. Sury's latest experiments show that two minutes at 96° to 98°, or one minute at 98° to 100° F., will be correct. The print is removed to a sheet of glass or a board and the surface gently wiped with a flat camel-hair brush saturated with warm water of about 95°. The brush should be kept fully charged with water. The print should be wiped alternately from top to bottom, from the left to the right, and also diagonally, the brush being held at an angle of about 50 degrees with the surface of the paper. The image will gradually appear, and development should be completed in about two to five minutes.

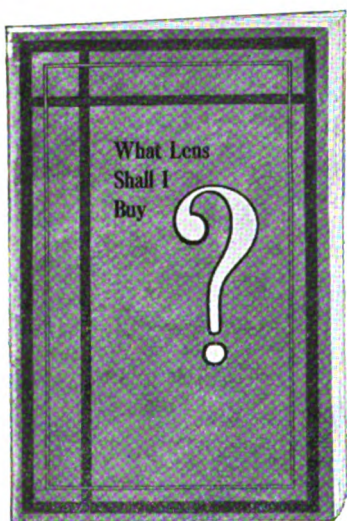
Sury papers are at present manufactured in two colors, namely, blue, suitable for all ordinary work, and bistre, which is particularly recommended for portrait work. The pigment used for the preparation of the bistre paper is a permanent one, but the blue color must be discharged either partially or completely by placing in 2 parts of hydrochloric acid to the 100 of water. The desired depth being obtained, the prints should be rinsed in cold water and hung up to dry.

For pigmenting, the dry print is pinned on to a board and the dry Sury pigment lightly applied with a camel-hair brush. It is then found that the print possesses the property of taking the pigment in direct proportion to the values of the shadows and halftones. This pigmenting can be done in a straightforward manner or the worker can modify the reproductions in accordance with his artistic tastes and ideas. To judge the progress of pigmenting, lightly blow the superfluous color from the print, and, in case it is desired to lighten any portion, apply a little powdered pumice with one of the brushes. High lights may be put in by touching with a piece of eraser sharpened to a point. The eraser must be kept clean by rubbing it on a piece of coarse sandpaper. Should it be desired to tint the white parts, a little of the polish can be taken off them by rubbing with pumice powder. By this rubbing the whole surface of the proof before powdering, the effects obtained are particularly soft and recommended to artists. Pigmenting

may be carried out in monochrome or colors—a full range of pigments being supplied for the purpose. Fixing is not absolutely essential but is recommended. The print, still attached to its board, is placed upright and sprayed with a special fixative, using the evaporizer about 18 to 24 inches from the print.—*The Photographic Journal*.

"What Lens Shall I Buy?"

THE booklet *What Lens Shall I Buy*, published by the Bausch & Lomb Optical Company, Rochester, N. Y., answers a question which is in the minds of many photographers. If you would like to know the best lens to use for various kinds of subjects you simply look in



the alphabetical list of subjects for the required information. The booklet also contains a table showing lenses recommended for various popular cameras. This information is of value to a prospective purchaser, and a copy of the booklet should be in the hands of every photographer. Address Bausch & Lomb Optical Company, 633 St. Paul Street, Rochester, N. Y.

A New Size of Camera

THE 8 x 10 size of plate or picture has the same proportion as the 4 x 5, a proportion that is being supplanted in favor by the postcard size in the latter case, and in the former will no doubt find a strong competitor in the new 7 x 11 size issued by the Eastman Kodak Company. This is perhaps the most pleasing proportion that could be given the view photographer, as it is a little shorter form of the parallelogram than the popular postcard size and a little longer than the 5 x 7; it is, in fact, practically midway between the two. For group work the new size is just right, while for view and landscape work the unnecessary sky space that is nearly always in evidence in the 8 x 10 print is transferred to

the ends, where more room is generally wanted. Best of all, the new form is much better suited to upright subjects, such as tall buildings and the like. In addition, the picture looks larger and the particular proportion will almost invariably show either much more of the subject matter, or larger images of the objects photographed, than will the 8 x 10 size.

The American Annual of Photography, 1917

THIS popular annual has come to hand and is full of practical articles for every camera user. There are papers in "Mastering the Anastigmat Lens," "Night Photography," "The Photographic Portraiture of Men," "A Convenient Dark-room," "Color Toning Bromides," "Gallery Lighting," and a number of other practical subjects full of meaty suggestions. The many illustrations also are of a wide range and high standard and add to the value of the text. Price, paper, \$1.00; Cloth, \$1.50. Copies can be supplied through this office.

30 x 40 inch Trays for the Dark-room

WE have long wanted a couple of 30 x 40 trays for the dark-room, but have hesitated in getting them, as the trays commonly for sale are too bulky to handle nicely, and we have been trying to scheme some way to make them light and serviceable, as I now have them. I have succeeded in getting the weight down to about 10 pounds which makes a tray that is easily handled, and I thought perhaps you would like to know how we made them.

In the first place I had two wooden trays made up of just as thin material as seemed possible, which was $\frac{1}{4}$ inch spruce sides and $\frac{1}{4}$ inch elm bottom, with four ribs running lengthwise of the bottom. The corners were all dovetailed and made as tight and strong as possible; then they were given two coats of P. & B. acid- and alkali-proof paint, and while the paint was still tacky we lined it with some thin asphaltum roofing-paper, folding in the ends a good deal like we used to line trays with oilcloth for toning baths, with the edges turned over the top edges of the tray and tacked down with copper tacks. Then the paper was pressed down with a hot flatiron, which pressed it firmly into place and cemented it like a rock. The paper lining was given two coats of the same paint.

These trays are extremely light, flat, and as strong and rigid as if they were made of heavy material, and look as if they would last for a hundred years.—PHIL B. KEELER in *Portrait*.

Market for Prints

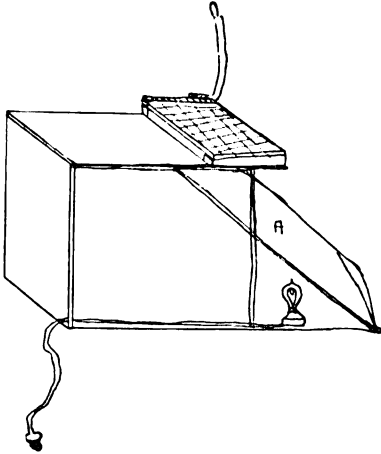
"THE INDEPENDENT," 119 West 40th Street, New York, N. Y., is now using striking landscape photographs and other views suitable for its covers. News photographs, pictures of scientific and civic innovations, etc., also are desired. Prints 5 x 7 inches, or larger, are preferred.

Trimming Device

SOMETHING that might be of interest is a unique trimming arrangement which will save

at least a third of a person's time in trimming prints with a white border.

Any kind of a box is used and one end taken out, then a sheet of glass is placed diagonally inside to allow trimmings to slide out into the waste-basket, as shown in (A) the accompany-



ing rough sketch. Then an ordinary electric wall socket is placed on the bottom of the box so the light will be directly under the cutting edge of the trimmer and is attached by an ordinary extension cord so the apparatus can be put out of the way when not in use—and can be set on a chair or wherever convenient to use. The light shines through the paper and the exact width of the margin can be seen in an instant. It will save the operator much time over any other method of getting even margins.—*Portrait.*

Dianol Developer

A NEW developer which needs only the addition of sulphite and water, and can be used for plates, films, or papers. It bears the additional recommendation of being sold by R. J. Fitzsimons, 75 Fifth Ave., New York City, who is widely known as the American agent for Lumiere plates and autochromes, and the Richard verascopes. Readers who want further information are referred to Mr. Fitzsimons, who will gladly take the matter up with them.

Mrs. Henrietta Hudson's Advent in Direct Color Photography

MRS. HENRIETTA HUDSON is a new name added to the list of those who are accomplishing great things with the camera. Her recent debut in New York was as sudden as it was successful. Before October last no one had ever heard of her; during November many were curious to know who she was and where she came from; before the end of the month she was elected a member of the American Institute of Graphic Arts of New York and almost simultaneously a member of the Royal Photographic Society of London. So, like the announcement of the daguerreotype, she "arrived" at once.

It was the exhibition of photography under the auspices of the American Institute of Graphic Arts that put Mrs. Hudson in the photographic "Who's Who." This exhibition proved to be one of the most comprehensive ever held, direct color photography being shown at its best. When early in October the doors of the exhibition were opened to the public it was found that among the photographs in color the one that attracted most attention was that of a fragile soap bubble in all its iridescent beauty, and it bore the label: "Henrietta Hudson." Here was an unknown who had accomplished a new feat in direct color photography with an autochrome plate. Interest was thus drawn to her other exhibits and they demonstrated that she was an artist with exceptional color sense.

Mrs. Hudson was then chosen a member of the American Institute of Graphic Arts and invited to address them. This she did at their first meeting in December. In a modest way she told them how she took up photography as an amateur only two years ago, and began at once with autochromes, though entirely ignorant of photographic procedure. Her description of the development of the first autochrome in complete darkness in the cellar of her country home, and how she screamed with delight when she found she had recorded color, was an intensely dramatic recital which, unfortunately, lack of space prevents describing here.

She told how she began then the study of photography and its chemistry seriously. Those whom she consulted in the matter tried in every way to dissuade her from wasting effort on color photography. It was impractical from every view-point; only a few colors could be recorded; it could not be used for lantern slides, and only those with unlimited means could stand the expense of experimenting with it. Mrs. Hudson proved to be a woman of resolute purpose; she had faith in the plates and confidence in herself; she experimented and experimented; she showed that the color scale was equal to that of a painter's palette and that it was admirably adapted for lantern slides.

When Burton Holmes projected her slides for the first time, during one of his lectures, the audience showed by their applause how they appreciated her accomplishment, and Mr. Holmes had to admit that his opinion, that autochromes were impossible for lantern-slide purposes, had been reversed. The marvel of it all is that Mrs. Hudson has taken up direct color photography at a time of life when other women are seeking leisure and contrary to all predictions she is making a success of it. Further, she does all the work herself and in the confines of her apartment on Riverside Drive, New York. Being a woman of determination and ceaseless energy, combined with an early art training and cultivated taste, she promises to be a most valuable addition to the ranks of workers in direct color photography.—STEPHEN H. HORGAN.

Professional Photographers' Society of New York

ACTIVE preparations are being made for the coming Thirtieth Annual Convention of the Professional Photographers' Society of New York, to be held February 26, 27 and 28, 1917, at Hotel McAlpin, New York City. Note this.



THE WORKROOM

By the Head Operator



REPAIRING FOREGROUNDS
A FOCUSING SCREEN
DODGES OF AN OLD STAGER
IDENTIFYING PRINTS AND TONING PROCESSES
SECURING REGISTRATION IN DOUBLE PRINTING
THE PARAMIDOPHENOL DEVELOPER
COPYING
STEAMING BROMIDE PRINTS
AN EFFECTIVE SUBSTITUTE FOR FARMER'S REDUCER
POSTCARD PRINTING AND DEVELOPING
A PLIABLE BACKGROUND
A CHEAP LANTERN SCREEN
GLASS-STOPPED BOTTLES—A USEFUL TIP
ALTERING DENSITY AND TONES IN BROMIDE PRINTS
SNOW PHOTOGRAPHY

A BROMOIL TRANSFER PROCESS OF THREE-COLOR
PRINTING
KNOW YOUR FIXING BATH
THREE TYPES OF LENSES
THE SHARPNESS OF NEGATIVES FOR ENLARGING
SOME USEFUL VARNISHES
TONING BROMIDE PRINTS BLUE
TO RENDER PLATED CAMERA FITTINGS TARNISH-PROOF
WATERPROOF CEMENT FOR GLASS
A QUICK WAY OF WASHING SMALL ROLL-FILM
NEGATIVES
CLEAN DISHES
EYES
WASTE
MAGNIFIERS

Repairing Foregrounds

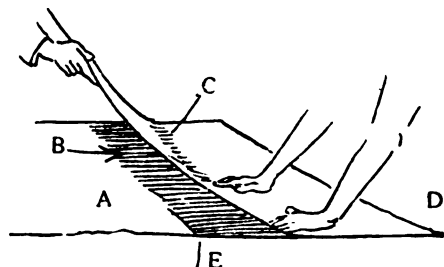
A TREMENDOUS amount of time and labor is often wasted by assistants having to spot out ugly patches and creases in the foregrounds of prints where a badly worn background has been used. A few creases made by careless rolling up is often the cause of a serious falling away of the whole of the foreground. Of course, it always gets a tremendous amount of wear by reason of the continuous trampling which it receives, and as soon as it shows light streaks and patches the time is not far distant when the whole coating of pigment will fall away, leaving the canvas to wear into holes. But at this stage it should not be left and considered to be "going home," as an effective repair is by no means a difficult operation, even to the renewal of the whole of the foreground. A description of the method of procedure for repairing the whole will cover the same ground as for repairing in parts.

Take the background off the stretcher, and, after transferring the bottom roller to the top, roll the background up, leaving out flat on the floor, face down, the part to be repaired. When the extent of the renewal has been decided upon the foreground is tacked down to the floor, putting in the tacks in a straight line.

While the canvas is kept taut another row of tacks is placed about 18 inches below the first row. The canvas between the two rows of tacks should not be stretched out of its ordinary dimensions, or kinks will be formed when the tacks are taken out and the foreground again falls into its original position.

The required amount of unbleached calico of the right dimensions (obtained at any large drapery house in the standard sizes) is now attached to the old material by means of rubber solution. This first sticking is done with solution, because it dries quickly and also because the foreground underneath is not damped in any way, thereby preventing any cockles or kinks

when the background is newly hung, and the draw is exercised by the weight of the new canvas. A line of about 2 or 3 inches in depth of solution should be smeared close up to the first row of tacks, also a similar line on the edge of the new canvas, and the two should not be placed together until they are quite "tacky."



A, back foreground; B, glue; C, new canvas; D, first row of tacks; E, second row of tacks.

This first bringing together of the new and old materials is the most important part of the whole proceeding. Assistance should be at hand to hold the new canvas squarely over the old, or the two may not eventually hang squarely unless properly brought together in the first place. The remainder of the sticking down is done with glue (about the consistency of cream) laid on the back of the foreground lying on the floor, and applied with a fairly large brush, not attempting to cover more than the space which is stretched between the two rows of tacks.

It is wise at this stage to get assistance in holding the new canvas out tight while the two are being brought together flatly by pressing and by patting with the palms of the hands, and seeing that they come together smoothly without any creases or air blobs, which is quite an easy

matter if some one holds out the new canvas tightly at each end.

As soon as this first portion has been glued together the row of tacks at *B* should be taken out and put in again, this time tacking the two materials together. Another strip is stretched, tacked down, and glued, repeating the process until the whole of the new canvas is attached to the old.

If the foreground is being repaired only in parts it is preferable to use rubber solution, doing each part separately.

If possible, the whole should now be left in its flat position until dry, but if it must be moved it is best to wait until some of the moisture has evaporated and the ground then tightly rolled up with newspaper over the painted surface, to prevent any possible injury from the damp glue. It is then left for a day or so to dry. If there happens to be any creases or wrinkles when dry they can easily be removed from the face with a hot iron.

The foreground may now want repainting completely, or it may only want touching where it has worn. The repairs that have been described would remedy any creases or cracks and give extra support to any weak and worn parts; but it often happens that when a background has reached the cracking stage the distemper generally peels off, leaving nasty patches. These may be patched up or the whole foreground may be repainted, which need not be a very skilful performance, as foregrounds, whether indoor or outdoor, are generally plain. The only skill required is the matching of the old color, and even this is not absolutely necessary; as long as the right tone is reached it will probably photograph the same in tone if not actually the same in tint. If the whole is to be repainted it would be best to stretch the part to be done on the background stretcher.

There are many different compositions with which to repaint, but none better and cheaper can be used than ordinary distemper well sized. The ordinary whitewash so often recommended is wretched stuff to handle, and it is difficult to gauge the necessary amount of size needed. An already sized distemper recommended is "Filocol," 1 lb. of which will cover about six or eight square feet: all that is needed to bring it to a proper consistency is a little water. It should not be made too thin or it may stir up too much of the old underlying color. It is perhaps too white for a light background, so a little vegetable black should be added to bring to a cool gray. Before applying to the background a trial should be made on a piece of card, dried to see that it matches fairly the old tone, and rubbed with the palm of the hand to see that it sets; if not, put in more size (Cannon's concentrated size), which has been first dissolved in hot water.

For a dark background the color should be composed of vegetable or lamp black rubbed together with a little burnt umber or burnt sienna, according to the old color, on a piece of glass with a table knife, adding the size gradually.

A mixture of white and black, considerably more black than white, sufficient in tone and quantity, should be made in a pail or pot and

"laid on" the background as flat as possible with a whitewash brush. If the background is not a plain one another lighter tone should be mixed and introduced here and there into the darker one, using the brush in downward dabs, with broad horizontal sweeps here and there to give variety and a feeling, when lying in its original position on the floor, of even ground. But this variety should be hardly preceptible, remembering the important fact that the color dries up considerably lighter.—*British Journal of Photography*.

A Focussing Screen

COLOR in the object is, I find (writes Arthur Wall, in *Photography and Focus*), apt to be very misleading, and anything which helps to get rid of it, so that we can see the picture very much as it will appear in the finished print, is helpful. One of the best ways of doing this that I know is to use a ground glass focussing screen of blue tint. I suppose blue glass could be bought and given a ground surface; but a simpler method of bringing about the same result is to use a film of dyed gelatin. An unexposed plate is fixed right out and washed, or else an old negative has its picture bleached out in the ferricyanide and hypo reducer. The clear film of gelatin so obtained should be stained an intense blue with the aid of a penny packet of dye, and then after a brief washing, which will reduce the depth of the color a little, the plate is dried and is bound up with its dye film in contact with the smooth side of the ground glass. For landscape and flower work especially I find this most useful.

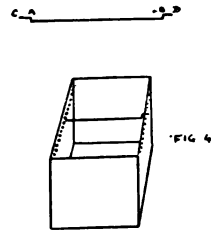
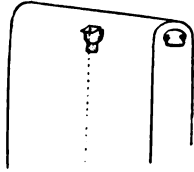
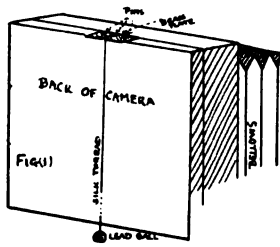
Dodges of an Old Stager

HERE are a few inventions and dodges, mothered by necessity, which may be of use to my brother photographers.

For Use in Photographing in Towns

Everyone who can discard the tripod in photography in towns—the time taken in its erection, the notice it attracts in a street, and the obstruction it causes being sufficient for its condemnation. It is astonishing how soon one becomes used to dispensing with it, until perhaps the only disadvantage left is the difficulty of keeping the camera square and the consequential "drunken" architecture which results. Now, to cope with this the ordinary spirit level is useless. To get the additional height required in working in narrow streets it is necessary to hold the camera as high as possible. In this position nothing less than an enormous level on the base of the camera would be workable, and even then it would be a weighty nuisance. The following simple and economical home-made substitute will be found entirely effective. A slight variation is necessary, according as the camera happens to be a square-backed one or of the rounded folding pocket type.

Let us take the square-backed camera first. Open ready for an exposure. The back will then consist of a changing-box or dark slide. Draw a straight line with a sharp bradawl down the centre of the back, from top to bottom. Rub



Chinese white into this, or paint it in with a fine brush. This line forms a guide. Take a piece of thin sheet brass, just thick enough to be stiff, size $\frac{1}{4}$ inch by $\frac{1}{2}$ inch. File a notch in the centre of one of the short edges. Bore three small holes, large enough to take a pin, as indicated in Fig. 1. The idea is to pin the brass on to the top of the back of the camera (or whatever forms the back when it is ready for action), so that a plumb-line attached to the middle pin and hung through the notch just touches the white line all along its length. The plumb-line is made of silk; the weight is a small ball of lead paper. Fig. 1 shows the line fixed ready for action. When the camera is held up, the slightest deviation forward, backward, or sideways is reflected in the movements of the plumb-line. It requires but a slight alteration in the shape of the piece of brass to suit every form of camera-back. If the silk be looped over the pin instead of tied to it, the line can be removed and stowed away when not in use.

Where the camera is of the rounded folding-pocket type, the plumb-line is fixed to the catch which most of these cameras possess, and which is used for opening the back. The piece of brass is now bent at a right angle at one-third of its length. The longer end is passed through the catch, which may be wedged up with a screwdriver for that purpose. A hole must be drilled near the edge of the shorter end, through which the silk is passed and secured with a knot. The nearness of the hole to the edge of the brass depends on the position of the catch itself. It must be so placed that the plumb-line just clears the back of the camera (see Fig. 2). When the camera is being carried about, the brass arm is pulled out of the catch and the silk is wound around it.

Developing Cartridge Films

Non-curling films are recognizable by their ability to curl at all available opportunities, at least until they are in the hypo. This tendency makes their development in an ordinary china or celluloid dish very awkward unless they be developed in the strip. Many photographers, however, are still strongly in favor of a method of development which enables each separate picture to be under complete control. This can be managed if a wooden dish be used. It should be sufficiently large to take two strips of two negatives, side by side. To keep these short strips flat, each is pinned by the four corners to the bottom of the dish. Don't use the glass-headed pins. When wet they are most difficult to handle, and scratched films result. The flat,

plaster-headed pins are the most convenient. Have a dozen of these pins, and run them into the top edge of the dish, so that they are available. While the pinning down of the films is being done the dish should be half full of water, and this should be poured off and the developer substituted when the pinning is completed.

When a negative shows signs of being sufficiently developed, cut it off, removing two of the pins so as to release it. The spare end of the film from which it is separated should be then pinned down. Small narrow strips of lead are useful for keeping the ends of a curly bit of film flat in the hypo. For drying the negatives, stretch a piece of cord along the edge of a shelf; support it with a nail every yard or so. Hang the negatives from this with hooks made of bent pins at regular spaces.

Developing Cut Films

Here, again, some of us prefer to have each film under individual attention. Select four dishes which will so fit one into the other that the bottom of one is always at least one-eighth of an inch from the bottom of the one below it. The lighter the dishes the better. Each dish has its supply of developer and contains one negative. They are then fitted one into the other, making a solid whole which can be easily rocked. From time to time the dishes should be taken apart, so that the negatives can be examined. If required, a cover can be made to make the top dish light-tight. The negatives in the other three dishes are practically, if not entirely, in darkness, except when under examination.

For washing cut films the ordinary rack in a washing trough is useless, as the films are not stiff enough to keep apart. The best form of washer to use is a print washer which has a circulating system, having for that purpose a row of holes along the top edge to let the water out. Bend a piece of stoutish galvanized wire as in Fig. 3. From *A* to *B* should be a shade less than the width of interior of the washer at the top. The length from *C* to *D* should be about $\frac{1}{2}$ inch longer. The "kink" should only be about $\frac{1}{4}$ inch deep. Pass this wire rod through the centre hole at the top of one side of the washer right through, and then through the corresponding hole on the other side, so that it stretches right across (see Fig. 4). To attach the films to this rod, hooks are necessary. To make these bend pins into a Z-shape, with rounded instead of sharp angles. The arms should be longer, in each case, than the middle piece of the Z. Take one of these bent pins, hold

one of its arms between finger and thumb of one hand, and the other arm similarly with the other hand, and twist one arm at right angles to the other. You now have a Z of which one of the arms is at right angle to its fellow. Put the point of the pin through the corner of the negative, hang the other arm over the bar, and there you have your film suspended from the bar. Fill the washer with water, and you then note the meaning of the kink, for, were it not for it, the top corner of the film would be just above the water line. You can hang a couple of dozen or more negatives from such a bar, and they don't scratch each other, and, being well above the bottom of the washer, they get a thorough washing. For drying the cut films, lift them one by one off the bar without unhooking them from the pins, and suspend them by the pins from a cord stretched along the edge of a shelf or across the room.

Packing Exposed Films and Plates

No tourist should travel without half a dozen stout, light-tight bags, to hold either his exposed cut films without any other packing, or to contain his exposed plates in their original box without any other covering. The relief of being able to slip plates or films into security without having to unfold and untie wrappings is very great. The bags should be made of two thicknesses of tough brown paper, the kind that will not crack when it has been doubled backward and forward a dozen or so times. To hold half plates the bag should be large enough to take a half

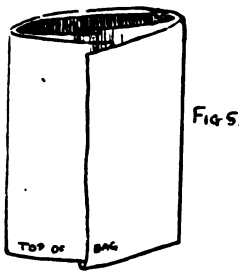


plate box comfortably in width, and should be 6 to 8 inches longer. Where the paper is folded should be the mouth of the bag. Use plenty of paper, and fold as in Fig. 5, fastening with glue. To make the bottom of the bag secure, glue each thickness of the paper to its fellow to a depth of about 1 inch. The end can then either be turned up or not. When films or plates have been placed in the bag, double over—two or three times—the spare length of the bag, thus making the mouth of the bag light-tight. A rubber band will keep the whole closed.—*Amateur Photographer.*

Identifying Prints and Toning Processes

A POINT of some considerable importance, particularly to portrait photographers, is the ability to tell what printing or toning process has been used for the production of a particular effect. That such is the case is evident from

the queries addressed from time to time to the editors asking what paper or method can be used in order to produce prints in imitation of a specimen, which, presumably, is the work of a competitor. Anyone fairly conversant with photographic printing processes is, of course, able to tell roughly what method has been used in the making of a given print. We all know the distinguishing marks of a carbon, a platinum, a bromide, or a P. O. P. print, yet in these days of intense competition between manufacturers there is so much ingenuity applied to the production of papers which imitate the results by other processes that I think many of us would be stumped if asked to swear positively that a print of unknown origin was by such-and-such a process. In saying this, I mean to suggest that it is a very difficult matter oftentimes to identify the printing process only by the appearance of the print. The reader has only to glance through the price lists of photographic printing papers in order to see the efforts which are made to produce prints on development papers which shall rival in their quality those by the carbon, platinum, or collodio-chloride process. Many of these papers do, indeed, afford a very close match with the prints by the processes which they impersonate, and if one relies only on the appearance of the prints, it would not be possible always to say with certainty what particular method has been used. But however much the final results may resemble each other, the chemical processes are in most cases essentially different. The image of which the photographic picture consists is of a different chemical composition, and it does not call for very much skill to apply chemical tests which will distinguish fairly sharply between the different processes.

Platinum and Bromide

One of the simplest applications of this chemical method is in telling a bromide print from one on platinum paper. The bromide image consists of silver, like that of a negative, and the application of any bleaching solution such as is used for the intensification of the negative will turn the bromide print white, or to a pale color, while it is without effect upon a platinum print. Solution of bichloride of mercury is as good as anything else for this purpose, and is usually at hand in the photographer's dark-room. There is no need, of course, to treat the whole print: a tiny spot of the mercury solution may be applied with a fine camel-hair brush, and will show by its non-action, or by the production of a white spot, whether the print is platinum or bromide. In the cases of the ordinary platinum papers (not those of the semi-glossy kind) the surface of the paper itself is some indication, though not an infallible one, owing to the success with which the natural surface of platinum paper is imitated in many brands of bromide. Often, also, in these descriptions of bromide paper, it is not the easiest matter to recognize the gelatin surface of the emulsion by the familiar plan of wetting a corner of the print, applying the finger, and noting whether the gelatin surface sticks to it. This test is rendered somewhat obscure, not only by the

grained surface of the bromide paper, but by the fact of its bearing an emulsion which has been specially hardened. A less indefinite test is to wet a corner of the print thoroughly with a little weak acid solution such as is used for clearing platinum prints, and then to rub it lightly with a fragment of rag stretched over the finger. The image on an ordinary platinum print is often partially rubbed away by this treatment, whereas it takes a good deal of rubbing to make any difference to the silver deposit on a bromide print. As I say, it is by no means a clear sort of test, but, nevertheless, supplies some indication of the nature of the print.

Sepia Platinum and Sepia Bromide

When it comes to distinguishing between a print on sepia-platinum paper and one on bromide paper which has been sulphide toned, the characteristic color of the sepia-platinum print is a fairly safe guide—at any rate, so far as platinotype sepia paper is concerned. The color of such a print is remarkably uniform, whereas results by sulphide toning vary very considerably as regards color. A chemical test can also be applied, although not so rapidly or with such unmistakable results as in distinguishing between a bromide and a black platinum. A sulphide-toned print is slowly bleached, to a greater or less degree (but never completely), in a solution made by dissolving about $\frac{1}{4}$ ounce copper bromide and about 2 ounces of sodium bromide in 10 ounces of water. The sepia platinum print will not be in the least affected by a solution of this kind, nor, in fact, by any solution, such as potassium cyanide, which exerts a reducing action upon other prints.

Print-out Prints and Toned Bromides

But perhaps the most frequent cases in which doubt arises are those where it is wished to discover whether a print is a toned bromide or is produced upon a print-out paper. In the case of ordinary P. O. P., toned with gold, there is never likely to be any doubt. The purplish tone is characteristic. In the case of collodion-chloride paper, the range of tones from warm black to red chalk is much wider, but here the collodion surface is readily distinguished from one of gelatin by touch when in the moist state or by noticing the way in which the print curls when immersed in water. In cases where a warm-toned print is suspected to be on a self-toning paper, it is most likely that the surface is also one of collodion, collodion self-toning papers being largely in the majority as compared with gelatin.

These differences afford a useful indication of the particular paper. They can, however, be supplemented by a chemical test which, while not completely satisfactory, is of some service in diagnosing a case. Practically any print on a print-out paper, whether self-toning or collodion-chloride, is reduced in depth to some extent by a solution containing both ammonium sulphocyanide and potassium ferricyanide. This mixture, Haddon's reducer, exerts a steady reducing action on a printed-out image, even when it has been toned with gold, and, to some extent, when

toned with platinum. Whether the action is exerted on the gold (or platinum) component of the image I am not competent to say. I should imagine it is not; but, at any rate, there is always a proportion of the image formed by warm-colored silver compounds, upon which latter, I believe, the reducer principally acts. If anything in the nature of a formula is wanted, it may be given as follows: 10 per cent. ammonium sulphocyanide solution, 5 ounces; 10 per cent. potass. ferricyanide solution, $\frac{1}{2}$ ounce; water, 10 ounces. A sepia-toned bromide, by which I mean a bromide or gaslight print toned by the sulphide process, will not be affected by this solution.

Other Toning Processes

Of other methods of toning which are in use, it is not possible to speak with the same degree of definiteness. I know of no test which can be used to identify prints produced by first toning with sulphide and then with a gold-toning bath. However, the characteristic crimson shade of prints made in this way is a fairly safe guide. Prints which have been toned with uranium can, of course, be identified at once by applying a drop of ammonia or soda carbonate solution, which instantly turns the warm uranium tone to black. In the case of prints which have been copper-toned, I am again uncertain of any reasonably reliable means of identification. Without having tried it, I may, perhaps, pass on the recommendation to paint a small patch on the print with a solution consisting of about 5 per cent. hydrochloric acid, in which has been dissolved a little perchloride of iron. This mixture is stated to yield a blue color upon a print which has been toned in the copper ferricyanide bath.—*British Journal of Photography*.

Securing Registration in Double Printing

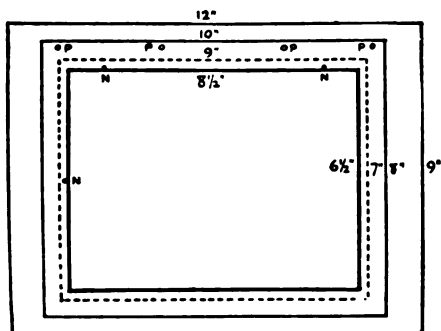
So much importance is attached, and rightly attached, to the prevention of any movement between the paper and the negative in the printing frame when opening the frame to see how the printing is progressing, that it will no doubt come as a surprise to many to learn that by a very simple device it is possible to take the negative right off the paper and put it back again without the slightest fear of imperfect registration. Yet such is the case; and those who have occasion to use negatives of comparatively large size, such as whole-plate or over, may find it to their advantage to make use of such an appliance.

It can be made to serve several purposes. When a negative has to be printed with great nicety it is a help sometimes to be able to see the whole of the picture at once instead of only the half which the ordinary form of printing frame permits. With printing-out processes, and, to some extent, with platinum, the effect of different shading devices for modifying the print can be seen, and so continued further or discontinued as necessity may require. When introducing diffusion by interposing bolting silk, matt celluloid, etc., it is helpful to be able to print the picture partly with, and partly without, such aids, and this with the ordinary form of printing frame is out of the question.

Working whole-plate size and printing in platinum the following method has been found very simple and quite successful. No regular printing frame is required at all. The "frame" consists of a small drawing-board, about 12 x 9 inches, selected because its framed construction was a guarantee against warping. It was covered with a piece of sheet rubber 9 x 7 inches, cemented down; but this the writer is inclined to think is not at all a necessity. On top of this is a piece of thin clear celluloid, which is 10 x 8 inches, as it happened to be in stock. One end of it is fastened to the face of the board, beyond the rubber, with drawing pins. Three fine needles are inserted through the rubber into the board, their tops being broken off, so that they project not more than an eighth of an inch, and small holes are cut in the celluloid so that it passed freely over the projecting needles. A piece of thick plate glass, 9 x 7 inches, completes the apparatus.

The needles are inserted in such a position that when a whole-plate lies centrally on the rubber two of them touch one of its long edges at about an inch from each end, while the third needle touches the centre of one of its shorter edges. It is obvious that a negative in such a position can be removed and replaced just as often as may be required, with the certainty that if it is pushed up against the three needles it will go into exactly the same place again.

In the diagram, commencing with the lowest element, is shown the drawing-board; next comes the sheet rubber, which is optional and therefore indicated with a dotted line; then the celluloid fastened with drawing pins marked *P*; under this the paper is placed for printing; upon the celluloid lies the negative, drawn with a thick line; and upon this (not shown) is the sheet of plate glass. The position of the three needles is shown by the dots lettered *N*.



To use the frame the celluloid is raised, a piece of platinum paper is put down on the rubber with its edges against the needles, the celluloid is brought down again, and its free end is fastened to the drawing-board with drawing-pins, or preferably, a bull-dog clip, so that it holds the paper flat and in place. The negative is laid on the celluloid and pushed up to the needles as described. For convenience they should project so far as still to be slightly above the level of the negative, but not above the level of a piece of

plain glass which is laid on the negative. On top of all is put the plate glass, and the whole is put out to print.

If we wish to introduce matt celluloid, bolting silk, or ground-glass at any subsequent stage in the printing all we have to do is to lift off the glasses and the negative, put in whatever diffusing material we are going to employ, and then replace them. The paper does not shift, being underneath the transparent celluloid, which is not thick enough to have any injurious effect upon the definition. It is advisable to carry the whole arrangement indoors to observe the progress of printing.—*Photography*.

The Paramidophenol Developer

ALTHOUGH the paramidophenol developer is perhaps as largely used as any other it is but little known under this name, and the properties of the developing substance itself are likewise as little familiar to the photographer. The use of the substances as a developer originated with Andresen about the year 1888, since which time the developer has attained wide popularity in its commercial forms of a highly concentrated single solution, suitable for both plates and papers, and requiring only to be diluted for use. Rodinal, which was the first commercial form of paramidophenol, has subsequently had other competitors, and though, so far as I am aware, the base of these other single-solution developers has not been, in the case of any one of them, mentioned as paramidophenol, it may be taken that it is this substance which is used.

For paramidophenol is marked among the other developers by very distinctive properties. The developing substance itself is soluble in water only to a very slight extent. For practical purposes of making a stock solution it is as good as insoluble. But it forms two kinds of compounds, both of which are soluble to a very considerable extent. Paramidophenol is, in fact, a curiously balanced substance which can act in a weak way both as a base and an acid. As a base it combines with strong acids, such as hydrochloric or sulphuric, forming, in the case of the former, the paramidophenol hydrochloride, which is the commercial substance used as the starting-point in making the developer and dissolves in water to the extent of about 1 part in 10 parts of water. But paramidophenol behaves also as a weak acid, and with strong alkalies, such as caustic soda, forms compounds which we may call, for example, sodium paramidophenolate. It is this sort of compound which is formed when a solution of caustic soda is added to a solution of the paramidophenol hydrochloride. The first addition of caustic alkali throws down the paramidophenol itself as an insoluble deposit, but this latter redissolves, as more alkali is added, and by using a suitable method of preparation a very concentrated solution can be made in this way, and one of very active developing powers. If the reader with some knowledge of chemical matters will consider for a moment he will see that by preparing a developer directly by addition of caustic soda to the solution of the hydrochloride there is left in the resulting developer something which is not wanted there,

namely, the chloride of sodium (common salt), which is formed by the interaction of the sodium of the caustic soda and the chlorine in the hydrochloride. While a developer can be prepared in this way, the better plan is to obtain the paramidophenol base by itself and to dissolve that by aid of caustic soda and with addition of some sulphite compound sufficient for the preservation of the solution.

Making a Concentrated Single-solution Developer

Some year or two ago M. J. Desalme, in a paper before the French Photographic Society, gave working instructions for the making of a developer in this latter way, and I cannot do better than give his directions in English weights and measures. We first dissolve $7\frac{1}{2}$ ounces of paramidophenol hydrochloride in 60 to 70 ounces of hot water. This solution ought to be quite colorless. If, from the presence of tarry impurity in the hydrochloride it is not colorless, the solution can be boiled for a few minutes with 1 ounce of animal black (bone black), which has previously been washed with acid. The hot black mixture is then filtered.

The next part of the process is to throw down the paramidophenol base, which is done by adding a solution of 1 ounce soda sulphite and $3\frac{1}{2}$ ounces soda carbonate dissolved in 20 ounces of warm water. This precipitates a bulky mass of paramidophenol. The mixture is allowed to cool and then filtered with a linen bag, from which as much water as possible is allowed to drain. The bulk of the paste thus formed should be not more than 30 ounces.

This paste has now to be dissolved to form the stock concentrated developer. It is placed in a large wide-mouthed bottle marked to a total bulk of 50 ounces. Ten ounces of soda bisulphite lye of the full commercial strength, 35° Beaumé, is well mixed with the paste, and then strong solution of caustic soda is added little by little. The caustic soda solution is made by dissolving 5 ounces of caustic soda in the minimum of water and making the total bulk to 10 ounces. As this solution is added and the mixture well stirred the paste gradually dissolves. About 8 ounces of the caustic soda solution is required. Toward the end of the process the caustic soda should be added in quite small doses, about 30 minims at a time, and, finally, the solution should be quite clear. A very little of the bisulphite is then added to give a very slight permanent precipitate—a precipitate, that is, which remains on thoroughly stirring up the mixture for, say, half a minute. Water is now added to make a total bulk of 50 ounces, and the solution is ready for placing in small bottles full to the neck, in which it keeps excellently. To form the working developer, it is mixed with from twenty to forty times its bulk of water.

Developing with Paramidophenol

The use of the developer itself is so familiar and so simple that it is scarcely necessary to say very much about it. For average negative work a dilution with 20 parts of water (1 to 20 devel-

oper) is about the best, but many workers prefer to use a 1 to 10 developer on account of the shorter time in which ample density is obtained. The developer is not one which gives density quickly; on the other hand, it is not one which readily fogs the emulsion. With many plates it is not necessary to add bromide, while in dealing with overexposure the paramidophenol developer calls for a much larger addition of bromide than other developing agents, such as pyro or hydroquinone. Perhaps the best way of using the solution for overexposures is that recommended by the makers of Rodinal, namely, to start development with a solution containing 5 minims of the stock developer and 5 minims of 10 per cent. potass. bromide solution in 3 ounces of water, afterward adding a further 5 minims of stock developer. Where considerable bulk of working developer is to be made up, but not to be used at the time, it is well to remember that it can be kept by using, instead of water, a 5 per cent. solution of soda sulphite for diluting the stock solution.

The developer is, as I have said, one yielding excellent results with plates, papers, and lantern-plates, and the only material for which, I think, it is not a good developer is roll film. My own experience may be different from that of others, but I have found it difficult to obtain anything but weak and flat negatives on roll film, for which undoubtedly the best developer is pyro soda.

I should say a word, too, on the use which can be made of the paramidophenol stock solution as an addition to other developers which are working sluggishly, as the result of partial exhaustion or of underexposure of the plate. A little added to the pyro-soda or metol-hydroquinone developers will often make a surprising difference in the developing power, and in the same category of working expedients comes the suggestion to add (but very cautiously) a little caustic soda to the working developer in cases where its action appears to flag. This last, however, is a somewhat risky method, since excess of caustic alkali above the quantity required to form the phenolate compound is liable to fog the emulsion, but it is one which may be tried when the only other alternative is to discard the plate. And, lastly, perhaps I may give a test which can be applied to a concentrated developing solution in order to see whether it consists of paramidophenol or of other developing preparations, particularly metol and hydroquinone in combination. Add a little hydrochloric or acetic acid—the strong acid mixed with, say, twice its bulk of water. In the case of paramidophenol the effect is to neutralize the caustic alkali combined with it and to throw down the base itself as a white deposit. Addition of further acid clears the solution again, the acetate or hydrochloride of the base being formed.—*British Journal of Photography.*

Copying

It seems to be generally taken for granted that anyone with a very elementary knowledge of photography can make a copy and that any old lens and camera will suffice so long as the

focal length of the one is sufficiently short and the extension of the other sufficiently long; hence it is that nine out of every ten copies require only a very casual glance to stamp them as what they are. A really well and carefully executed copy should be indistinguishable from the original except on very careful examination—that is, of course, providing the picture copied is in a good state of preservation, and in the event of such original being faded or otherwise defaced the copy should in every case be an improvement upon the original. I might perhaps go further than this and submit that even where the original is good the copy may, by careful treatment, be made to excel that original both technically and artistically. The main cause of failure to obtain good copies lies in the fact that the operator, as a rule, is prone to look upon the operation of copying as something beneath him—that he is expending labor capable of higher things on a trifle, or, to use an old simile, that he is using a sledgehammer to crush a fly.

Looked at in a sober light, it will be seen that the idea is a fallacy, and that the operator who uses his abilities to the utmost, who, in fact, extends himself with the aim in view to produce the very best result from what may be a very third-rate picture, will at least have the satisfaction of knowing that he has done his very best, and what is more, he will probably gain more credit than he would have obtained as the result of an original masterpiece.

Perhaps the most glaring fault in a great many copies is that they are not like the original—in other words, they are distorted; this is mainly due to the lack of precaution as to having the camera absolutely square with the picture being copied. If the outside lines of the picture are not perfectly square on the resulting negative it must be clear that distortion of the features has taken place, and this is in most cases due to the use of an ordinary stand camera. If the camera is placed on a long board or ordinary kitchen table, and the board to which the picture to be copied is affixed, is fastened straightly at one end, the lens being directed to the exact centre of the picture, there need be little fear of distortion occurring, and certainly may be made doubly sure by placing a T-square against the copying board and the baseboard of the camera. Naturally, it is necessary to see that the swing back, if the camera in use possesses one, is in its correct position, that is, not swung either forward or to either side. All this seems a very simple matter, and yet it is often overlooked, as it is "only a copy." Then as to the lens: it may be admitted that a cheap lens will produce a fairly good copy, but it is advisable that even if cheap it should be good and free from aberration. Distortion may also occur when an unmounted print is being copied owing to its not being absolutely flat, and the better way of overcoming any tendency this way is either to mount the print or to place it in an ordinary pressure frame and copy through the glass, care being taken to avoid reflections. These same reflections are often a source of trouble where an enamelled print is in question, but with a little extra care they may be avoided,

either by alteration of the lighting on the picture or by screening off surrounding objects with dark material. When the original is at all faded or discolored it is always advisable to use a panchromatic plate, and the same remark naturally applies to all colored originals. Some operators when copying always stop their lens down to the utmost because, as they say, the picture is not likely to move, so the length of exposure does not matter, and they ensure absolute sharpness. In my idea this is a mistake. The largest possible aperture should be used consonant with the correct degree of sharpness, for directly you go beyond that you are merely sharpening the grain of the paper and thereby giving additional work to the retoucher; in fact, a much larger stop may be used in copying than in photographing a solid object for the whole of the subject is in one plane and, given a decent lens, if one part is focussed sharply the whole picture must necessarily be the same.

The development of a copy should be carefully watched, and directly all necessary detail is out and sufficient density obtained the development should be stopped at once, the main object being to obtain a soft and yet brilliant result. Too thin a negative may give a soft print with sufficient brilliance if gaslight paper be used for printing, but for P. O. P. the development requires to be carried farther, and for bromide farther still, for as a rule a copy negative will be found to print through more easily than an original. It will be found that a fairly strongish developer, and one that is well restrained, will, as a rule, yield a better result than a normal, as used for original negatives.

Many photographers are of opinion that the negative of a copy should not be retouched, but personally I consider that it requires far more careful retouching than an original. By retouching I do not mean remodelling of the features, or the mystic touch which is apt to impart an appearance of more youthful days, for so far as the actual portrait is concerned no alteration should be made, but the coarseness due to the copying of the grain of the paper requires careful working, not only on the face but on every part of the negative. I have known retouchers and first-class men earning high wages spend two hours or more on a post-card negative copied for publication purposes, and the result has certainly justified the labor and expense entailed. The same amount of work on an ordinary copy, where perhaps only six or, at most, a dozen copies are required, as against thousands in the case I have quoted, might be deemed wasteful and unnecessary, but, as a rule, it will be found that an increased price can be easily obtained for such high-class work, and even if it were not so, the extra cost of labor will easily pay for itself in the shape of advertisement. In cases where the original pictures are very weak or flat, as also with line drawings in ink or pencil, it will be found that the use of a slow process plate will ensure better results than can be obtained in the ordinary way. Ultra rapid or even so-styled extra rapid plates should never be used for copying.—C. BRANGWIN BARNES in *British Journal of Photography*.

Steaming Bromide Prints

THE steaming of bromide prints puts practically a new surface on the paper. Regular bromide workers make good use of this dodge to cover up traces of hand work. When a print has been worked up, by strengthening some parts with pencil and rubbing down other parts with typists' india rubber, the surface is anything but attractive. The way to produce a more pleasing effect is to let the steam from the domestic kettle play on the surface of the print. This partly melts the gelatin coating and allows the hand work to sink in. The steaming must be done carefully. On no account should the print be held nearer than 6 inches to the spout of the kettle, and it must be kept moving all the time so that the steam may act evenly all over the surface. If one steam is not sufficient, the print should be allowed to dry before the second attempt is made. It should be pointed out that, where prints are worked up with broad masses of water color, the steaming dodge is not so effective.—*Professional Photographer.*

An Effective Substitute for Farmer's Reducer

THE cost of potassium ferricyanide (red prussiate), which forms one of the components of the well-known Farmer's reducer is exorbitant. A substitute may be had by using the ferric chloride, or perchloride of iron, which in combination with hypo makes a very energetic reducer, and used alone a controllable agent.

The formula is, as follows:

Ferric chloride	60 grains
Citric acid	120 grains
Water	4 ounces

The plate is rocked in this solution and the reduction carefully noted, and when the proper degree is reached, immediately washed under the tap. If the negative requires considerable reduction after treatment with the iron and citric acid, it should be placed for half a minute in a solution of hypo about 10 per cent. strength. Here the action goes on very rapidly, and care must be had not to let it go too far. This reducer may also be used for local reduction in the same way as the Farmer's reducer.

Postcard Printing and Developing

Look at it how we will, with favor or otherwise, there can be no doubt that the postcard portrait has come to stay. There must be very few firms who have not, to a greater or less extent, felt their influence, and they have come to be, in very many cases, a large portion of the daily output.

In my own case it has been a tale of steady progress, from an occasional dozen or so ten or twelve years ago to several hundred a week at the present time. Happily all the "better-class" work has not been pushed out, and it has been my endeavor so to arrange matters in the printing-room that a large number of cards may be dealt with without undue interference with the ordinary output of prints. A record of my method may be of service to others.

I have never worked a "strip" printer, although I have no doubt it is a very useful adjunct to the ordinary printing apparatus, all my work is done with a "Cyko" printer, which is too well known to need description. One alteration was made upon finding that the ruby lamp supplied with the apparatus gave too small an amount of light for purposes of adjustment.

A 5 candle-power incandescent lamp was obtained, and, after fixing in its holder, was covered with a thickness of ruby paper, and enough light was obtained by this means to ensure ease of adjustment without it being strong enough to cause trouble by fog, etc. A plate-holder is used to carry the negative. This was made on the premises by cutting two pieces of cardboard—one with an opening just the size of the negative, and the other $\frac{1}{8}$ inch smaller all round, and fastening the two together, taking care that the upper layer is not too thick for the thinnest negative likely to be used in it, or loss of definition would possibly result.

The masks are cut to allow a margin of $\frac{1}{8}$ inch round the card, and are cut with large enough borders to permit of fastening to the plate-holder just mentioned, thus avoiding any disfigurement of the negative by stamp paper or whatever may be used for fastening.

Raised guides are carefully fastened at the proper distances—one at bottom, and another at the side of mask—so as to allow of proper adjustment being made in the shortest possible time.

Exposure varies, of course, with the density of the negative.

A 5 candle-power lamp is used for bromide cards, and the light is sometimes further reduced by placing tissue paper upon the piece of frosted glass, which forms a permanent part of the printer. Care is taken to adjust these things so that an exposure of from two to six seconds is required, as if the exposures are shorter than this there is some difficulty in correctly timing to ensure regularity in the whole of a dozen cards.

For development a 10 x 8 dish containing 30 ounces to 40 ounces of solution is used, amidol being found best for all kinds of papers and cards.

Having everything in readiness, six cards are inserted at one end of the dish, and then moved singly to the other end. In the vacant end six more cards are placed, being moved one by one to the top of the others, and then the whole dozen is moved back singly, thus bringing those first inserted at the top. Then another six are inserted, and again they are all moved singly to the opposite end of the dish, and thus development proceeds until the whole batch of cards is disposed of.

The correct depth is judged as the cards lie in the dish, and they are taken out in sixes, just as they are put in; and, as long as the exposures have been made correctly, twenty-four to thirty cards can be kept going at the same time.

The developer is added to from time to time as is found necessary to keep it up to working strength.

After development the cards are, of course, rinsed in plain water and fixed as usual, this

latter operation being attended to by an assistant.

Time of development is about $2\frac{1}{2}$ minutes, and this gives ample time for proper exercise of judgment as to depth.

I find no difficulty by this method in printing and developing a hundred cards in an hour, and there are no reprints.

Greater speed could no doubt be obtained by increasing exposure and shortening development, but obviously this could only be at the loss of brilliance and evenness.

The absolutely essential thing in this, as perhaps in all other branches of photography, is correct exposure. Having this, everything else is easy.—*British Journal of Photography*.

A Pliable Background

I HAVE always wanted (writes A. W. E. in *Camera Craft*) a lantern screen that could be rolled up out of the way when not in use, and one that would not easily crack if it became wrinkled a little in the process. Another lantern slide man gave me a formula which he had clipped from some journal, and I tried it with the best results. The mixture is compounded as follows:

Glycerin	1 pound
White glue	1 pound
French zinc oxide	2 pounds
Hot water	1 gallon

The glue, of course, should be dissolved by heat in a portion of the water and the glycerin well worked in. The mixture is applied while hot. The cloth should be tightly stretched on a frame during the process of painting and drying. And here is a hint as to the tacking on of the sheet. Do not try to start at one corner and follow along one edge in tacking to the frame. Place a tack or two at each corner, and then tack half way between on each edge. Then place a tack half way between each tack already in place. The result will be an even, tight surface, one impossible of attainment by tacking along one side at a time.

A Cheap Lantern Screen

A GOOD, cheap lantern screen for a photographer can be made from pieces of oil-painters' canvas, carefully joined, or any other close material. Bolton sheeting or even calico, however, can be used. The screen should then be sized with a 30 per cent. starch solution, and painted with the following:

Water	$\frac{1}{2}$ gallon
Whiting	12 ounces
Glue size	4 ounces
Treacle	4 ounces

Glass-stoppered Bottles—A Useful Tip

ALTHOUGH numerous hints have been given from time to time for dealing with a stopper that has become tightly fixed in its bottle, the writer cannot remember seeing any suggestion as to how this vexatious occurrence can be

avoided. The immovable stopper is frequently the outcome of placing the stopper into the bottle when either, or possibly both, are wet with the photographic solution which the bottle contains. The result of this is that the stopper not only fits tightly (as, of course, it is designed to do), but also that when the liquid between neck and stopper dries out it leaves a small residue of crystals or other incrustation which practically "cements" the stopper into position. To obviate this, care should be taken in pouring solution into a bottle, to avoid making the neck of the bottle wet. This can be ensured by using a suitable funnel for the purpose. Then to make assurance doubly sure both stopper and neck should be rubbed with a dry, clean duster. This simple method of prevention is worth a dozen cures, many of which may be somewhat doubtful and not without danger to both the photographer and to the bottle—*Amateur Photographer*.

Altering Density and Tones in Bromide Prints

THE tones and density of the image in a bromide print are as subject to modification as those of the image in a negative. That is to say, they may be modified by intensification or reduction quite apart from toning or alteration of the color. It is perhaps in the matter of intensification of the picture that the greatest scope is offered. Many a badly developed print or enlargement can be saved and a fine-toned picture produced if one of the following methods is adopted. The same or similar conditions are open to us when intensifying negatives, slides, etc., but the photographer does not always realize that a bromide print and negative differ chiefly as regards their support; the negative or lantern slide is a gelatin plus silver image on glass, the bromide print is the same thing on paper. Here then we note that in our intensifying or other methods of dealing with a paper print we must bear in mind that a formula or method which works quite satisfactorily with a glass or celluloid basis may stain the paper.

Color Changes or Toning

In general it may be said that intensifying a bromide print also changes its color. Hence it is difficult to draw the dividing line between intensifying and toning actions. We therefore have to note that while we strengthen the image by adding new material we may so change (lighten) the color that we are thereby little if anything better off as regards contrast.

Grouping Methods

Although there have been published or advocated a considerable number of formulae for bromide print intensifying processes, yet when one comes to boil them down into simplified form there are really only a few in actual number. These may most conveniently be grouped together, e. g., silver, chromium, mercury, and copper, with a few odd methods which may be described as "various."

Silver Intensification

For silver intensification use the following: (a) Dissolve 10 grains of silver nitrate in distilled water 1 ounce; (b) distilled water 2 ounces, citric acid 6 grains. Bathe the print in 2 ounces (b) for a minute or so, return this to the graduate and add 3 grains of pyro and apply to the print for a minute. Again return to the graduate, and add 1 dram of (a) and apply to the print for a minute, then add another dram of (a), and so on.

It would appear that (1) the print must be made acid; (2) the silver (a) must be added a little at a time, until we have 1 ounce (a) in 2 ounces (b); (3) staining may come from the discolored pyro, therefore if the mixture becomes greatly discolored it should be thrown away and a fresh lot mixed; (4) if the silver be added too quickly it may be deposited on the paper, where there is no image to aid as a nucleus.

Chromium Bleachers

Here is a table which shows at a glance characteristic or typical formulæ employing chromium in the bleaching bath. Note: the quantities are grains of solids and minims of liquids per 1 ounce of water.

(Water—1 ounce)

Potass. bichromate	5-20	10	10	10	5	—
Chromic acid	—	—	5	—	—	10
Calcium chromate	—	—	—	—	—	—
Potass. bromide	—	5	—	—	—	—
Potass. iodide	—	—	—	—	5	—
Hydrochloric acid	1-20	—	—	—	10	10
Nitric acid	—	8	—	8	—	—
Alum	—	—	—	—	15	—

The print is thoroughly bleached in one or other of these baths. The lightest parts of the original print practically vanish, the darker parts turn a nondescript orange-gray. The print is washed under the tap till free from yellow stain. We may hasten the discharge of color by adding a little, say 5 grains per ounce, potass. metabisulphite to the wash water; or for the same purpose we may use: Water 20 ounces, soda sulphite $\frac{1}{2}$ ounce, sulphuric acid or hydrochloric acid 20 minims. There is no gain by prolonged immersion in the bleacher or when washing after bleaching. A pyro-developed picture will not weaken in the bleacher so much as images produced by most other developers. On the other hand, a first image by pyro shows less stain when chromium bleached and then darkened by some other developer.

We may redarken our bleached print by various agents, *e. g.*: (1) Water 1 ounce, ammonium sulphide (liquid) 3 minims; this gives a fairly strong result of warm black color, but may stain the print. It should be used very dilute only. (2) Any of our ordinary alkaline developers. These need not contain any bromide and should not contain excess of soda sulphite. (3) Water 1 ounce, ammonia fort. .880 3 drops, Schlippe's salt (sodium sulphantimoniate) 5 grains. This gives a red-brown image, but has a tendency to yellow stain the high lights. Wash in very dilute ammonia.

If a minimum change of color is desired amidol or diamidophenol can be recommended, *e. g.*, water 1 ounce, soda sulphite 20 grains, amidol or diamido 2 to 3 grains. In general by diluting the developer and allowing a proportionately longer time we get results that are slightly warmer in color.

Pyro-soda gives a warmish and sometimes greenish black.

Caustic alkali in the developer may cause frilling.

The whole process may be repeated, but it does not afford much further strength and is not unlikely to yield stain.

Stains

Stains may be due to greasy, hot fingers; imperfect fixing before bleaching; partial bleaching as when two or more prints overlap in the bleacher, etc.; and insufficient washing after bleaching.

Mercury Bleachers

The second group of bleaching baths contain a mercury salt in some form, as may be seen from the typical formulæ here brought together for ready comparison.

(Water—1 ounce)

Mercury bichloride	3	3	10	5	—
Potass. bromide	3	9	5-25	—	—
Potass. ferricyanide	—	4	—	—	—
Am. chloride	—	—	—	3	—
Soda sulphite	—	—	—	—	90
Mercuric iodide	—	—	—	—	5

As before mentioned, the figures indicate the grains of solids per ounce of water.

Darkening Agents

We have quite a choice of darkening agents. The following notes apply in connection with those baths containing mercuric chloride, *i. e.*, mercury bichloride, *i. e.*, the first four columns. After bleaching wash the print in water slightly acidulated with hydrochloric acid, say 4 to 5 drops per ounce.

1. Strong liquid ammonia 5 to 6 drops per ounce water—warmish brown-blacks.

2. Soda sulphite 10 grains per ounce—gray-brown.

3. Potass. metabisulphite 10 grains per ounce—cold gray to violet gray.

4. Gold chloride 1 grain per ounce—blue-purple, blacks.

5. Am. sulphide 3 to 5 minims per ounce—warm-red, purple-blacks.

6. Hypo 5 to 10 grains per ounce—purple-browns.

The soda sulphite and mercuric iodide can hardly be called a bleaching bath, as it effects little color change as compared with the other bleachers. It might better be termed a "browning bath." After washing, it should be followed by any alkaline developer—preferably one without sulphite.

Copper Bleacher

Water	1 ounce
Copper sulphate	10 grains
Potass. bromide	10 grains

After bleaching wash in water acidulated with nitric acid, from 4 to 5 drops per ounce. The print may be darkened by any alkaline developer or by a 5 per cent. solution of silver nitrate in distilled water.—*Amateur Photographer.*

Snow Photography

THE fundamental fact to remember is that when the ground, trees, etc., are covered with freshly fallen, *i. e.*, clean snow, this white sheet is acting partly as a reflecting and partly as a light-scattering agent with regard to the light from the clouds, sun, and sky which falls on it. The consequence is that the same subject with and without snow—all other things being equal—requires a very different exposure. Roughly put, a cover of clean snow enables one to halve the exposure of the scene without the snow. But this must not be taken as a cast-iron rule, as there are various factors which *may* alter it considerably. The next point is that a snow-clad scene very often means one in which the foreground presents very strong light-and-shade contrasts. Thus there is much more contrast between a dark tree trunk and white snow than there is between the same tree trunk and, say, earth or grass. Nevertheless, the old rule of exposure for the nearest darks of pictorial importance still holds good. But in such a case—*i. e.*, where the high-lights (snow and ice) may be over-exposed—one's aim should be to give enough, but no more than just enough, exposure. With regard to development, the old rule of "Expose for the shadows and let the high-lights take care of themselves" will not do in present-day dry-plate photography. It requires amending to read, "Expose for the shadows of pictorial importance, but develop so as to preserve gradation in the high-lights." This means that we must not carry on development so far as to make the second and third lights as dense as the high-lights. You will find in practice that as soon as the highest light "shows through," *i. e.*, is unmistakably visible as a dark patch on the back or glass side of the plate, it is time to think about stopping development. But this is not to be taken as a cast-iron rule, for with some plates the high-lights are much more visible at the back than in the case of other plates. But if the worker sticks to one brand of plates and once gets to know the appearance of correct development, this, among other signs, is a useful guide. If the factorial system is adopted it will be advisable to lower the factor, say, from 12 to 10, or in that proportion, when dealing with snow subjects. In general, it is better to under- than over-develop, as with over-development it is not possible to get back the lost gradations in the high-lights by reduction, while a slightly under-developed negative can easily be intensified to any required degree by choosing the right process. No special plates are required, but certainly it is very desirable to have them backed. In general, we

have more latitude, *i. e.*, room for errors of judgment, in the matter of exposure with a plate of the rapid class than with the ultra-rapid speeds.—*Amateur Photographer.*

A Bromoil Transfer Process of Three-color Printing

AFTER dabbling in color photography for upward of twenty years, I think I have hit upon a method which can give results at least as good as any practised at present, is simpler in working, and more certain in results. There is no kinkling of tissue as in the stripping film, no frilling as in ordinary carbon or Ozobrome methods, no heartbreaking with dyes as in pinatype, and no uncertainty such as the gummist always experiences. In addition, the process is inexpensive. Any kind of effect, any kind of texture and surface are at command, and the "control" is unlimited, so that the "personal" element can have full scope. In this and in several other respects it is an ideal process, and will, I venture to think, become popular with color enthusiasts among both amateurs and professionals.

It is because of the many defects in the different processes mentioned, in all of which I have worked, and—this may surprise some readers—have been able to sell quite a number of portraits to the general public, that I have sought to work out some more certain, ready and effective method. But even with the Raydex method—which is improved Ozobrome and excellent when everything goes right—there has recently been so much uncertainty in the working of the tissue, owing, I believe, to the difficulty in obtaining raw material of standard quality, that I decided to experiment in Bromoil transfer. I had long considered this practical, but was fully alive to the difficulties. The principal of these were the depth to which each color should be printed, and register of all three. Of course, the negatives must be correct to start with. I need scarcely say that in no color process is even moderate success possible unless the negatives have been correctly exposed, correctly developed and are in balance. It is easy to go wrong in any color-printing even when starting with correct negatives. But in the system here advocated a patient worker can be reasonably sure of obtaining the result aimed at. Briefly, this is assured by thin successive printings.

Beginning with the yellow—which must be fairly correct before the red is applied (as this color must be underneath)—thin printing of the red and blue *alternately* can be employed and the image built up until the full range of tones and any depth of color desired is obtained. This is the great and outstanding feature of the method. In addition, there is complete freedom from defects in other processes. There is no blistering, no frilling, no temporary supports; the color being transferred to the final support at once. At first I wrought with collotype colors thinned with Bromoil medium, but recently I wrote to Messrs. Sinclair Co., Limited, sending them three primary colors to match, which they did with great courtesy and despatch. The tubes they sent me work well.

It may be in order to mention here that each printing must be thoroughly dry before the next is applied. From beginning to end this rule must be adhered to. It means time, and is a drawback to this beautiful process, but the patience required is fully compensated for when the last blue printing has been applied and the picture, bold, strong, and vigorous, or delicate and soft in detail, stands out a thing of beauty, which, we are told, is a joy forever.

The Bromide Print

The success of the process must obviously depend upon the quality of the bromide prints, and these, of course, must be made from negatives as carefully and correctly exposed and developed as for any other method of color printing. The prints must be vigorous and full of detail. Over-exposure must be avoided, and yet an exposure bordering on this is necessary. A weak amidol developer, well restrained, is probably the best. A suitable print, and one from which a perfect transfer can be obtained, will have been at least five minutes in the developing dish. This is a fairly good guide. If the print develops quickly and the high-lights begin to obscure earlier than this, it is over-exposed, and will give a flat transfer. The shadows must have time to darken thoroughly, and the old adage for plate-exposure of exposing for the shadows and allowing the high-lights to take care of themselves, can be applied here in reverse order—that is, an exposure must be given that will bring out all the detail in the high-lights. Should the print be hard, with high-lights lacking in detail, no amount of coaxing will induce it to take on pigment in these parts. A print that is perhaps a little too dense can be used. Careful treatment and “hopping” the high-lights will brighten it up, but when the high-lights are just white paper nothing can be done: a new set of prints must be made.

Register

To obtain exact register of the three transfers is not free from difficulty, and I must confess I have experienced much trouble in this direction. But difficulties were made to be overcome, and I have devised and now employ a method which is simple, easy, and effective. Before bleaching the prints—that is, after they have been fixed in plain hypo—the acid fixer comes after the bleaching—I take the print for the blue and one of the others—it is immaterial which comes first, as all three must be dealt with—and lay them dripping wet on a sheet of glass, keeping the blue print on top. The water between the prints causes them to slip backward and forward easily, and, held up to the light, the prints can be quickly brought into register. Then firmly hold the prints together, allow the water to drain away for a few moments, and then the prints, since they cling together, will not go out of register if carefully handled. Taking them off the glass, lay them on a smooth table. Next pierce a hole through the prints anywhere near each corner. A darning needle is just the thing. The third print is treated in the same manner, brought into register with the blue printer and

holes pierced near the corners to correspond with the others. Three holes can suffice, but I always make four. After the yellow print has been inked and put into position on the paper to receive the transfer, guide marks are made with a soft lead-pencil by drawing a line from the pierced holes to the edge of the paper. These can easily be removed, when printing is completed, and thus leave a clean margin all round the finished print. In all subsequent printings it is only necessary to bring the holes in line with the pencil marks to ensure correct register.

On Canvas or Paper

One of the greatest recommendations of this process is the variety of final supports which can be used. Paper ranging from smooth, even glossy, surface, if desired, to the roughest hand-made, will readily suggest itself, the former for fine detail and the latter for broad effects; but canvas or painted wood panels can also be used. In both canvas and wood the surface must be painted white. The prepared canvas is retailed by the artists' colormen, and can be had in sheets. It is coated with a gray medium and one coat of flake white should be sufficient.

Paper Brushes, etc.

As in bromoil and in bromoil transfer, any good bromide paper is probably suitable. The only difference, as far as my experience goes, is that some brands bleach at a lower temperature than others. It need hardly be impressed upon a beginner that in this, as, in fact, any other photographic process, the best comes cheaper in the end.

Limitations

Although the results obtained are beautiful and, as can be easily understood, from an artistic view point offer possibilities entirely beyond the reach of any other three-color printing method, there is a limit past which no combination of colors laid one on top of the other can go. Until we can obtain inks as transparent as, say, the old stripping film, the shadows will always retain a more or less heavy appearance. In many subjects this is not a fault, but in others it is a drawback. The remedy would be to place the color side by side instead of one on top of the other. I have an idea, but cannot spare the time to experiment with it, that by using a screen such as employed in half-tone block-making, this might be possible. If enlarged bromide prints were used the screen could be held in contact with the paper during exposure. Placed at a different angle for each print, the lines would intersect, and the question here would be so to arrange the screen that the little dots of color in the finished print would lie side by side as the dyed starch grains do in an Autochrome. Instead of the screen being held at an angle the better plan would be to have three screens specially ruled so that, if held in the same position for all three prints, the desired result could be obtained by purely mechanical means. If this idea can be carried out—and it seems quite practical—it should furnish the ideal method of color photography. Bromide prints

made in this way would be equally suitable for the Ozobrome or Raydex process and the results should be superior to any previous color process on paper.—CHARLES DONALDSON in *British Journal of Photography*.

Know Your Fixing Bath

ONE can't become too intimately acquainted with the peculiarities of the ordinary acid fixing bath, especially during the hot summer months. There is no better, cleaner-working fixing bath for developing-out papers, and there is no one photographic solution that is more abused. As a consequence, a large portion of the ills to which a photograph is heir may be traced to the fixing bath.

The acid fixing bath keeps the print hard and firm, stops development immediately, prevents developer stains and fixes the print if the bath is properly made and is in good condition.

One of the principal causes of trouble is the worn-out bath which remains clear, even after it has been used for as many prints as the hypo in the solution can be depended upon to fix thoroughly. Sixty-four ounces of the regular Artura fixing bath should never be used for more than the equivalent of two gross of cabinet prints, which would be approximately six dozen 8 x 10 prints. This does not apply to Artura alone, but to all developing-out papers.

Nothing is more uncertain than an improperly fixed print. It attacks your reputation in an underhanded way—stabs it in the back, as it were—and you learn of the injury too late to use first-aid measures. The print may look all right when it leaves your hands, but after the customer has had it for some time it begins to look sick.

The highlights yellow first and if it has had very little fixing the entire print may discolor. Keep an account of the number of prints your bath has fixed, and make a fresh solution as soon as it nears the danger point, which should be while the bath is perfectly clear.

There are many other causes of trouble, the first of which may be in compounding the bath. The most approved method is to make a stock solution of hardener and make up a fresh fixing bath every day or for every batch of prints.

Stock Solution of Hardener

Water	80 oz.
E. K. Co. sulphite of soda	16 oz.
No. 8 acetic acid (28 % pure)	48 oz.
Powdered alum	16 oz.

Dissolve the chemicals in the order named.

We do not say "dissolve the chemicals in the order named" from force of habit, but with very good reason. If the alum is added to the sulphite *before* adding the acid, a precipitate of aluminum sulphite is formed which it is very difficult to again get into solution. Be sure the sulphite is thoroughly dissolved, *then* add the 28 per cent. acid and *then* the alum. Some photographers prefer to dissolve the sulphite in half the water and the alum in the other half, but in compounding, the acid must always be added to the sulphite *before* the alum.

To make the fixing bath, dissolve 16 ounces of hypo in 64 ounces of water, and when sure the

hypo is thoroughly dissolved, add 8 ounces of the above hardener. If the hypo is not thoroughly dissolved, the addition of the hardener is liable to make the bath milky. The bath should be clear, and if not, it is an indication that sulphur has been released, and with sulphur released the solution becomes a toning bath as well as a fixing bath.

The addition of any acid (with the exception of sulphurous) to plain hypo will release sulphur. Alum will do the same, but not in the presence of acetic acid and sulphite of soda. The alum is the hardening agent, the acetic acid is the clearing agent and arrestor of development, the sulphite of soda in combination with acetic acid is the preservative, so it is readily seen that the one-solution acid fixing bath answers a three-fold purpose.

Prints could be developed, rinsed in a short stop and clearing bath of acetic acid, fixed in plain hypo and hardened in an alum bath, but the acid fixing shortens the operation and does the same thing better.

The chemical action of sulphite of soda and acetic acid in preventing the formation of sulphur is due to the fact that any sulphur which is formed combines with the sulphite to form hypo. In fact, hypo is prepared commercially in this way by boiling together sulphite of soda and sulphur. If sulphur has already been precipitated in the fixing bath, further addition of sulphite of soda will not dissolve it (or re-form it into hypo) as a cold solution of sulphite of soda is only capable of dissolving sulphur which is about to be precipitated and which at this stage is in a very finely divided condition.

Practically all the trouble encountered with the acid fixing bath is due to the releasing of sulphur and its consequent action on the print that is being fixed.

Impure sulphite of soda, old sulphite or sulphite that has been exposed to the air will contain considerable sulphate, which has no action as a preservative. If such soda is used in making a bath and it becomes milky it is due to a lack of sufficient *pure* sulphite.

Sulphite of soda oxidizes even more readily in solution than in its dry form, so the hardener should be kept in a bottle tightly corked, and the prepared fixing bath should be poured into a bottle if it is to be used a second time. Oxidation will destroy a bath that has never been used if it is allowed to stand in an open tray for some time.

Heat will also cause sulphur to be released from the hypo, even though a bath has been properly prepared, so it is safest to make the fixing bath only for immediate use in hot weather.

It is as important to wash prints thoroughly after fixing as it is to fix them properly. Prints should be kept separated in the wash water to allow the fixing solution to be thoroughly eliminated from the emulsion. If prints lie matted together in warm water they may begin to tone in spots, or if they are removed from the water before the hypo has been entirely eliminated, any portion of the print containing hypo may turn brown after the prints have been laid out to dry.

Acetic acid No. 8 (28 per cent. pure) is specified

in our formulas because it is the proper strength for the fixing bath, and may be procured at any photographic supply house. You may be depending upon your local source of supply for acids, in which case it is just as well to use glacial acetic 99 per cent. pure, provided it is properly diluted before it is added to your other chemicals. To make a 28 per cent. solution add 3 ounces of 99 per cent. acid to 8 ounces of water.

This dilution of the glacial acid is important, otherwise an excessive amount of sulphur dioxide gas would be given off from the sulphite, even though only an equivalent quantity of strong acid was employed.

Knowing the action of the acid fixing bath, and taking proper precautions to prevent sulphurization, will ensure permanent prints, even in the hottest weather. And with a stock solution of hardener it is certainly very easy to dissolve sixteen ounces of hypo in sixty-four ounces of water and add eight ounces of the hardener. There is really no excuse for fixing bath troubles, either in summer or winter, if we will familiarize ourselves with the above facts and keep the precautions constantly in mind.—*Trade News*.

Three Types of Lenses

THE names of lenses are very numerous, but these names by no means represent different types. Broadly speaking, lenses may be divided into three classes—the portrait, rapid rectilinear, anastigmat classes—but, though this classification may seem quite familiar, it is not certain that the essential differences are generally understood. These differences mainly consist in varied degrees of correction, and the points of chief importance to the user are not the particular aberrations that are corrected, but the varying behavior of the three classes at large and small apertures and over large and small fields. It must be recognized that photographic optics has not yet reached such a stage of perfection as to permit the production of a lens that will work equally well at large or small apertures over either large or small areas. In every case there is a certain amount of compromise, and the correction for a large aperture involves the sacrifice of some other quality, as does also the production of good definition over large fields.

Taking the portrait type of lens first, the early specimens were essentially lenses corrected for very large apertures but over very small fields. At full aperture they may produce the most exquisite definition over an area not much bigger than a postage stamp, but give very inferior results over a larger area. Obviously such lenses may be of extreme value for certain work, and astronomers in particular are always glad to come across a fine specimen of the early type of Petzval portrait lens that possesses these qualities, for the central definition excels anything that can be secured with modern photographic lenses. This particular quality is, however, by no means necessary for portraiture; hence in modern types of portrait lenses some of the central definition has been sacrificed for the purpose of getting better definition over a larger

area. The alteration is one of degree only, and so the portrait lens is still essentially a lens that will work at a very large aperture, but will cover with good definition only a very small area or angle.

In the next type of lens, more or less accurately designated "rapid rectilinear," the most essential difference is a reduction of aperture and the power of covering a bigger field. While a 6-inch portrait lens will sharply cover only the central part of a quarter-plate, the rapid rectilinear $f/8$ should cover the whole sharply to the corners. This represents about the most that can be expected from rapid rectilinear lenses, and, while the lenses of the same or similar type have been issued with $f/6$ apertures under various names, they will not cover such large plates. The best of these $f/6$ lenses form types intermediate between the rapid rectilinear and the portrait type, while the worst are simply rapid rectilinear lenses fitted with an aperture that is too large to permit of good definition anywhere.

Next is the anastigmat type. This is essentially a lens that at large aperture will cover a large area; but to attain this very useful quality again, sacrifices have to be made, the chief of which usually is the perfection of definition at small aperture. At first sight this seems a serious matter, but a little consideration will show that it is one of small moment so long as large apertures are in use. The small aperture forms only a small portion of the large one, and the imperfectly corrected area of the lens in use with the small aperture plays a very small part in the formation of the image when the large aperture embracing the more perfectly corrected and much larger areas remote from the centre are used. There is also a certain amount of compromise as regards the definition in the area covered. Perfect definition cannot be secured over the whole area, and, as a rule, the best definition will lie at the centre and in a circular zone somewhere between the centre and the margins of the disk covered. The chief virtue of the anastigmat lens is that it will cover a larger area than either the portrait or rapid rectilinear types at a large aperture. If a large aperture is not wanted, the rapid rectilinear will work almost as well, and, in fact, will fulfil most of the requirements of the average photographer. On the other hand, if a very narrow angle alone is to be covered, a portrait lens will work as well as an anastigmat, and probably at an even larger aperture. The anastigmat is the most universal of the three types, as it will do all that the other two will do, but for a great deal of ordinary work it is by no means essential.—C. W. PIPER, in *British Journal of Photography*.

7 The Sharpness of Negatives for Enlarging

THERE is too wide-spread error that the want of sharpness in the photographic image from very rapid gelatino-bromide emulsions is caused by the grain of the plate. It is true that if it is a question of enlarging an image 150 times, special emulsions of collodion and albumin must be employed. With these the grain only becomes observable with a magnification of 200 diameters, and at such magnifications it is only with a

highly corrected lens and most precise mounting of the apparatus that a sharp image can be secured. In the usual operations of photographic enlargement, however, a magnification of more than four diameters is seldom required.

In general terms, fast plates produce images with a grain less fine than slow plates. When the emulsion is prepared at as low a temperature as will insure the dissolution of the gelatin, it is quite transparent but very insensitive. As the emulsion is heated to increase its sensitiveness, it is seen to become more and more opaline, and a microscopic examination shows that the bromide of silver flocculates in grains of increasing volume. There is, however, no necessary relationship between the sensibility of the emulsion and the size of the grain, and the majority of manufacturers have succeeded, by processes more or less secret, in preparing rapid emulsions with a relatively fine grain. For example, among the products of the Lumière works, the "sigma" plate has three times the speed of the "blue label" plate, and yet the grain of the former is notably finer and more uniform than that of the latter. The "violet label" plate has seven times the sensitiveness of the blue label plate, nevertheless its grain is comparable in fineness with the sigma plate. The grain of the sigma plate is minute enough to define details one-fortieth of a millimetre, and with an enlargement of four diameters the sharpness of the image will be the order of one-tenth of a millimetre (about 0.004 inch). In practice, a departure from precise definition from two to two and one-half times this value is admissible. It is therefore not in the grain of the emulsion that the cause of poor definition in enlarging must be sought, but in the defects of the optical system and its mounting and to the treatment of the plate in the developing process.—E. CONSTET, in *Revue Générale des Sciences*.

Some Useful Varnishes

MATT varnish: (1) Gum sandarac 1½ drams, gum mastic 20 grains, ether 2 ounces, benzol 6 to 10 drams. (2) Gum sandarac 1 dram, gum dammar 1 dram, ether 2 ounces, benzol 6 to 10 drams. The less benzol the finer the "grain" of the varnish.

Cold varnish for negatives: (1) Celluloid cut up into small chips 10 grains, amyl acetate 1 ounce. (2) Dissolve 1 ounce borax in 1 pint of boiling water, add 4 ounces powdered shellac and simmer gently for half an hour. Strain while hot through fine muslin into a bottle. Let it stand for a week, and decant off clear part for use.

Negative varnish for hot application: (1) Best hard white carriage varnish 3 ounces, methylated spirit 5 ounces. (2) Sandarac 1 ounce, Venice turpentine 2 drams, oil of turpentine ½ ounce, alcohol or methylated spirit 10 ounces.

Black varnish: Shellac 1 dram, methylated spirit 1 ounce, lampblack q. s. to creamy consistency.

Dead black varnish: Gold size and lampblack to consistency of soft cheese. Then add about eight times the volume of turpentine.

Retouching varnish: 10 to 20 grains of red rosin, turpentine 1 ounce.

Encaustic varnish for polishing prints: White wax 30 grains, benzol 30 minims, oil of spike 30 minims. Mix by aid of gentle heat, and apply with piece of white flannel.—*Amateur Photographer*.

Toning Bromide Prints Blue

THIS may be done by various formulæ, but in all cases it is essential for a good bright result that the bromide print be fully developed, thoroughly fixed, and well washed.

Blue Toning Baths: (1) (A) Water 2 ounces, potass. ferricyanide 8 grains. (B) Water 2 ounces, ammonio-citrate of iron 4 grains. Mix A and B, and add 10 drops of nitric acid. (2) (A) Water 2 ounces, uranium nitrate 6 grains, acetic acid 60 minims. (B) Water 2 ounces, potass. ferrocyanide 4 grains, ammonio-citrate of iron 6 grains. Mix A and B. (3) (A) Water 2 ounces, potass. citrate 4 grains, potass. ferricyanide 4 grains. (B) Water 2 ounces, ammonio-iron alum 10 grains, hydrochloric acid 2 minims. Mix A and B.

To Render Plated Camera Fittings Tarnish-proof

PHOTOGRAPHERS who are particular concerning the appearance as well as the efficiency of their apparatus can ensure that all plated parts of cameras and attendant accessories are rendered tarnish-proof by employing the very simple but effective method here described. The parts to be treated should be slightly warmed and then coated, by means of a fine soft brush, with a solution composed of collodion thinned with alcohol. This coating dries immediately, leaving a thin transparent film on the metal; this film, although invisible, gives complete protection against atmospheric influences. Should it be necessary at any time, the coating can easily be removed by gently rubbing with a soft cloth dipped in hot water. The idea can be applied equally well to sterling silver ware, and might be found useful to photographers, who, being the fortunate possessors of silver plaques or medals, wish to display them to the best advantage without the trouble of frequently cleaning them with plate powder or liquid polish.—*Amateur Photographer*.

Waterproof Cement for Glass

DISSOLVE 50 grains of gelatin in about 1 ounce of water and then add 10 or more grains of acid chromate of potassium. If this solution, freshly made, is applied to the two edges of a break, the pieces bound together for a few hours, meanwhile being placed where the sunlight can act upon it, a perfect mend will result. The fracture will be hardly noticeable, and even hot water will have no effect upon the cement.—E. T. R. in *Camera Craft*.

A Quick Way of Washing Small Roll-film Negatives

THE other day the writer was desirous of washing a strip of roll-film negatives taken with

a small pocket camera as quickly as possible, and the following idea was hit upon: the strip of film was taken from the fixing bath, and held film side up, one end of the strip in the right and the other in the left hand, under the tap so that one end was considerably lower than the other. A rapid stream of water from the tap was then allowed to flow down the entire length of the film, starting at the top immediately under the tap. The film was held so that it was hollow in the centre, thus allowing a better passage for the water. After five minutes' fast washing as described above, the drainings of the film were allowed to drip into a solution of permanganate, and indicated that no hypo was present. The above method is of especial value at the present time when most of us are busy, and shortens considerably the uninteresting business of washing.—*Amateur Photographer*.

Clean Dishes

CLEAN dishes are essential for good work. Dirty dishes, graduates, etc., are the chief factors in most spots, stains, etc., both on plates and paper. Make a mop by tying a piece of loofah to a piece of firewood. With this clean the dish with strong cheap hydrochloric acid, sold cheaply as spirits of salt. Rinse out with water, and give a final polish inside and out with another piece of loofah and a rub of sapolio.—*Amateur Photographer*.

Eyes

If your sitter's eyes are rather small, then it will be advisable to select some poses in which the eyes may be turned slightly upward. If, on the contrary, the eyes are large and staring, as though they had been pushed forward, then a downward look will be more becoming. If, again, the eyes are deep set, as it is called—*i. e.*, giving one the idea that they had sunk somewhat into the sockets—then the pose should be pretty near about full face, and the eyes turned, not directly toward the lens, but to some object near the camera.—*Amateur Photographer*.

Waste

MORE terrible than waste of money is waste of power. Carelessly we sacrifice our health, our very lives. Sickness is a result of waste of our power of resistance, an evidence that we have failed to heed the laws of health.

Fight the waste of time! Some of us have more money to waste than others, some have more health to spend, but we all have twenty-four hours a day which no one can take from us. No one? No one but waste! With the whole golden twenty-four hours at our command we fritter away minutes making up our minds, we lose hours in thoughtless conversation, we waste incalculable time looking back when we should look forward.

Last of all is the most criminal form of waste—the waste of opportunity. When a chance comes to do even some trifle that will

help us on our way up, we refuse to exert the extra ounce of energy necessary to grasp our chances. When the opportunity knocks at the door, we tell her, "I'm too busy to see you, come back later." It's waste of opportunity that is holding you down!

Whatever form waste takes, fight it. Protect your money, your power, your time, your opportunity from waste! When you have learned to conquer waste you have learned the lesson of success.—*Service*.

Magnifiers

MAGNIFIERS should be used as near to the camera lens as is practicable.

With a fixed focus camera the lens of which is set at infinity, the focus of a supplementary lens to bring any near object into focus will be the distance of the object. Thus to photograph a still life group three feet from the camera will require as magnifier a positive lens of 36 in. focus.

Magnifiers used on a fixed focus camera do not alter the f numbers of the stops.

PATENT NEWS

Under this heading it is proposed to include each month a list of all the U. S. Patents; and brief abstracts of the more important, and to include also such foreign patents as present special features.

Copies of any patent can be obtained from the Commissioner of Patents, Washington, D. C. Price, five cents each.

M. P. and Phonograph Records. K. Madaler. 1204091.

Etching Plates. J. J. C. Smith. 1203802.

M. P. Color Filter. Zollinger and Mischorisniky 1203681.

Projector. F. A. Hardyman. 1204272.

Camera. H. J. Gaisman. 1203603.

Enlarger. G. R. Watson. 1204098.

Printing Frame. E. C. Scudder. 1203917.

Roll Holder. J. S. Greene. 1204011.

Slide Carrier. W. C. Johnson. 1203744.

Shutter. W. N. Bartlett. 1205079.

Shutter Release. F. W. Smising. 1204509.

Film Cleaner. Singleton and White. 1205039.

M. P. Projector. M. C. Hopkins. 1204771.

M. P. Screen. A. T. Jacobsson. 1204775.

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M. P. Projector. F. Norte. 1204585.

Shutter Release. F. L. Scott. 1205486.

Renovating M. P. Film. A. P. H. Trivelli. 1205822.

M. P. Synchronizer. J. W. Billings. 1205427.

M. P. Film Cleaning. J. Tessier. 1205583.

M. P. Film. J. A. MacBride. 1205367.

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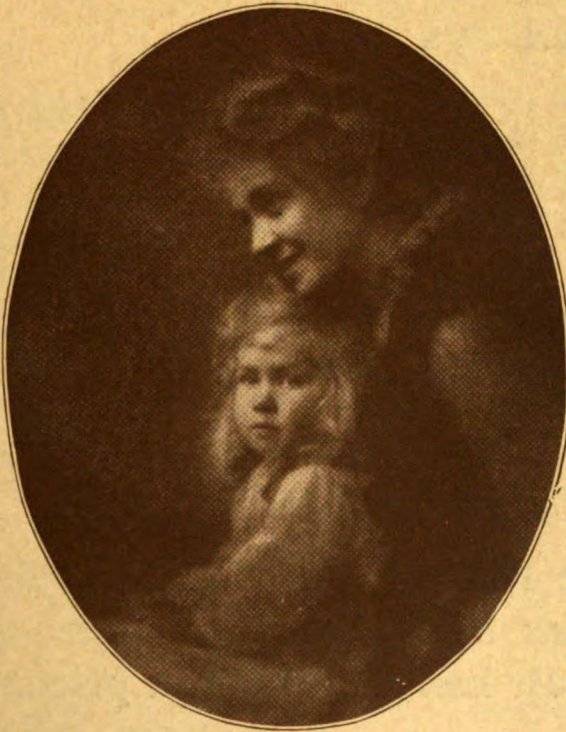
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VOLUME LIV

FEBRUARY, 1917

NUMBER 2



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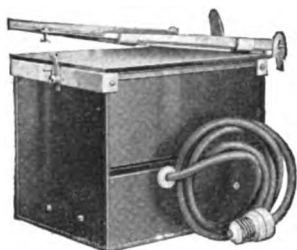


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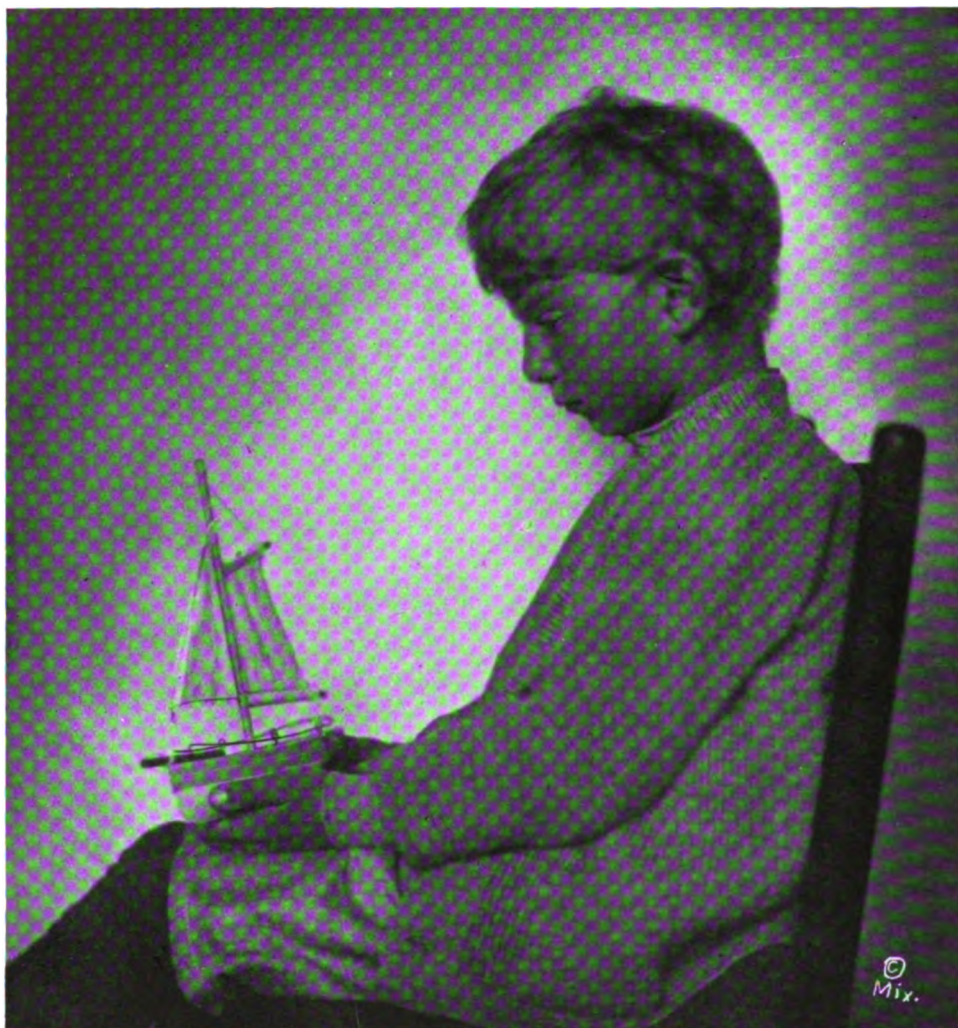
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COMPOSITION AND ARRANGEMENT

THERE is one subject which will always furnish an interesting line of thought for either the professional or amateur photographer. It is a subject that may be treated by many writers, each giving his views with clearness and succinctness; it may be studied by the majority of readers of photographic literature, but from the examples of work seen every day, it is still necessary to urge photographers on to greater efforts in regard to composition and arrangement.

It is a mistake to think that out of the ordinary everyday family who come to the studio to be photographed an ideal picture can be made, or that twenty or thirty persons who have associated with each other for a short time, such as we find in schools and clubs, can be made to furnish material for or enter into the spirit of an ideal artistic composition such as the photographer may have in his mind; nor is it within the bounds of possibility for any artist to make a prize picture from such a combination of persons. The subjects for a group which has for its object the illustration of some

story, poem, or whatever other romantic idea the photographer may have, must enter into the spirit of his theme, they must be trained not only in expressing the attitudes which are necessary to explain the story, but they must also give expression in their countenances to whatever thoughts the story may suggest. What would be the effect of a picture where the attitude denotes life, action, energy, everything that goes to illustrate a story of active and daring adventure, if the face could not express the feelings which we imagine should be felt by a person in such a position? It would, most undoubtedly, be flat, uninteresting and absurd. I have seen in many photographs evidence of this want of feeling and harmony of expression; while the attitude told you a story, the face belied it.

If we look at the works of celebrated artists we will see that the face and attitude express the same idea. Love, hate, fury, despair, fear, horror, illuminate, sadden, or distort the countenance and help with clearness and force to bring the story of the picture vividly before

(47)



BY E. L. MIX, NEW YORK

our minds, while the attitude speaks, as it were, and gives greater effect to the whole. Take, for instance, one of Meissonier's paintings, "The Sign Painter," in the Metropolitan Art Museum. A reviewer says: "The scene is altogether a transcript from a past generation. If we remark the expression of these men (the cavalier and sign painter), we see characteristics which reflect their inner and true personality. What amiable self-complacency is betrayed in the satisfied air with which the sign artist awaits the cavalier's verdict upon his work, and how consummate is the cool criticism on the part of the latter. We should not know where to look for a counterfeit presentment of man that approaches to nature herself than this unimpassioned inspector of the tavern sign. He is real to the very creases in his boots and the buttons on his coat." Can the glowing description of the poet or the realistic language of the tragedian clothe a scene with more ex-

plicit meaning than the pencil of the draughtsman, the brush of the painter, or the camera of the photographer? A mere description can never equal or appeal to us as strongly as when we see it before us in a picture. The painter has a greater advantage over the photographer in being able to dispense with any objectionable detail that might destroy the beauty of his subject. As a celebrated writer observes: "The details of the prose of nature he omits and only gives us the spirit and splendor. In a landscape he will give us the suggestion of a fairer creation than we know. He knows that the landscape has beauty for his eye because it expresses a thought which is to him good, and this because the same power which sees through his eyes are seen in that spectacle; and he will come to value the expression of nature, not nature itself, and so exalt in his copy the features that please him. In a portrait he will inscribe the character and not the features, and must esteem the man who



BY E. L. MIX
NEW YORK





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sits to him as himself only an imperfect picture or likeness of the aspiring original within."

The photographer must be satisfied with nature as he finds it; whether it is frowning or smiling, he must be content. Therefore if the subject is not in entire harmony with his ideas, if he does not enter into the spirit and give his thoughts entirely toward carrying out whatever story the picture is intended to illustrate, the result will be a failure. I would, then, say to the photographer, be satisfied with representing the character of your group and refrain when you have but indifferent material from trying to adorn a moral or point a tale. It is also well to remember that a long course of study is as necessary for the photographer as it is for members of any other profession. The greatest painters, poets, and writers study the works and profit by the experience of men who lived in by-gone years. They would not, or could not, reach the highest point of

perfection if they had not done so. The works of men who lived away back in the ages which we call barbarous are eagerly devoured, and the creations of their hands and brains are studied by the great men of this and other generations, and why? Simply to gather material for the foundation of works which they expect to create. There are rules and reasons for everything, and unless men train themselves to go strictly according to the rules that govern their work and find out the reasons why such rules are applied to it, they cannot accomplish much, they will be toilers in the dark, stumbling and groping to the end.

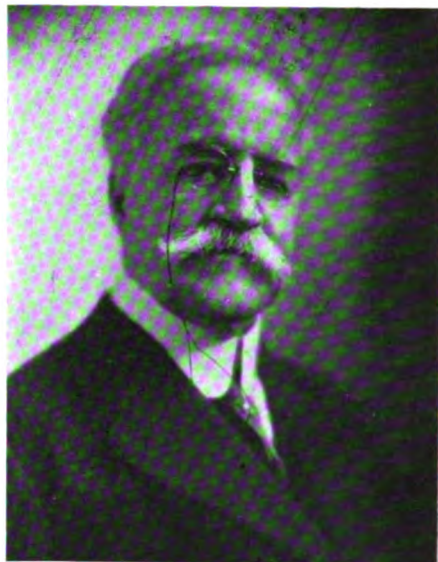
At the present time, when the works of the greatest artists are faithfully reproduced and explained, it is easy for every photographer to study them and gain very great benefits from doing so.

The paintings and illustrations of ancient and modern times are collected and put in convenient shape by the pub-



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lishers of photographic works, together with criticisms and explanations by celebrated art writers; these will be found to contain many things which are neces-

sary for the photographer to know. Study the works of others, master their details, then give life to your own thoughts.

SERVICE AND THE COMMERCIAL PHOTOGRAPHER

BY G. D. CRAIN, JR.

PHOTOGRAPHY is an art, and therefore one is safe in assuming that the photographer of ability must be an artist.

On the other hand, the commercial photographer is dealing with commercial conditions and commercial men, and in order to make good in that field he must adapt himself and his methods to its peculiar and severe requirements.

The business man of today is forced by his customers to give service in all that the word implies, and when he goes into the market to buy anything, whether it is a carload of lumber or half a dozen 7 x 10 photographs, he likewise is looking for top-notch service;

and in many cases quality of the work, not backed up in this way, will not win the appreciation and the price commanded by reasonably good work and service that is beyond criticism.

Now, before going any further, it may be well to stop and consider some of the things suggested by service in connection with commercial photography. What is meant by service, and what must the photographer who is anxious to provide it do, in order to feel that he has done everything that in reason should be asked of him?

First and foremost, service in business demands promptness.

The business man who is buying

photographs, and is promised them for a certain hour of a certain day, expects to have the photographs at that time or know the reason why. The photographer may have a beautiful set of excuses—his customer would probably refer to them as "alibies"—but they will not pass muster, because the buyer is not interested in "reasons why," but in getting the work—in getting service.



By E. L. MIX, NEW YORK

The work must be done according to instructions. Once having told the camera man what to photograph and how, the customer expects that the pictures will indicate that these instructions have been carried out to the letter. If the photographer has departed from them, even with some show of reason, he is going to have a hard time making good on the matter of service, because the first thing the customer will have looked at is the details which he expected to be developed by reason of his special instructions along this line.

Now, it should be remembered that the average business man is not an expert on photography. That is what makes the situation all the more difficult for the picture man. The concern which is dealing with amateur photographers, handling their developing and printing, has the advantage of being able to meet its customers on its own ground and to explain all of the conditions in technical terms. The photographer who is doing portrait work is in a distinctly art field, where the requirements for the best results, from an artistic standpoint, are given precedence over everything else.

But in commercial photography everything that is demanded is results. Excuses are not legal tender, and failure to carry out instructions is an unpardonable sin.

The element of time is all-important. Much commercial work is done with a certain time limit in view. This applies, of course, to news pictures more definitely than anything else, but it usually figures in a great many other cases. The customer wants to get pictures of his new line of samples made in time to catch a certain important customer at a certain city where his salesman is working; the lawyer is anxious to have a picture made for use in a case, work in which is being held up awaiting its development; the trade journal is holding an edition for a picture with which to illustrate one of its leading articles, and so on. If you ever realized the value of time, it is when you are making a commercial picture which is to play its part, possibly, in swinging a deal or deciding a case involving thousands of times the value of the plate.

The photographer may explain that there are conditions over which he has no control; that the weather is going to determine his ability to expose his plates under favorable conditions, and that other elements may develop to delay the completion of the work. That being the case, then, he should either have a definite understanding on this score with his customer or he should make a special effort to overcome unfavorable conditions.

It is, of course, true that equipment is being devised constantly with the object of enabling the photographer to disregard natural conditions to a larger extent than formerly, and the commercial worker, most of all, needs these aids, because, as suggested, his customers are less likely to regard as valid excuses for failure to produce the work on time, based on weather conditions.

The point to be borne in mind, however, is that if promises are made, those promises should be carried out if it is humanly possible. It is far better not to make a promise, and then to deliver the picture at the time desired, than to agree to get the pictures out at a certain time, only to fall down. In one case the customer will be delighted at the appearance of the finished work ahead of the time expected; in the other, he will be disgusted at the failure of the photographer to make good. It goes without saying that the first photographer will establish a reputation for service and the other will lose it.

If there is any doubt about the ability of the concern to deliver photographs at the desired time a qualifying clause should be used, so as to protect the photographer. "We will do the best we can, but we cannot promise them at that time," would save the face of many a worker who, because of some untoward weather or other condition, finds that he must delay delivery of photographs. He wanted to please his customer, and so he promised; result, his own discredit and the displeasure of the buyer.

Another important point is that if the photographer, after agreeing to get the work out at a certain time, finds that he is not going to be able to do so, he should by all means notify the customer and ask for an extension of time.

You have no idea how much better that is, from the stand-point of the photographer, than to wait until the customer, who possibly has been going ahead, counting on the delivery of the work at the agreed hour, calls up only to learn that the pictures have not been finished.

If the photographer, anticipating his inability to complete the work, telephones the buyer and explains the conditions, asking for an extension of time, he will get it willingly nine times out of ten and the customer will be impressed with the business-like character of the concern with which he is doing business. Likewise, he will make his own plans accordingly, and his inconvenience, due to the non-delivery of the work, will be minimized. It is the disregard of the photographer for the interests of others, shown by a failure to notify when work is delayed, that "puts him in bad" with customers and makes them register mental vows never to do business with them again.

There is a certain commercial photographer who is conceded by many to be an exceptionally good man, technically speaking. But he is all technic. He regards the conditions of his work and the work itself as much more important than the practical use to which it is put. In other words, the artistic demands of the photograph are paramount with him, and unless he feels that the picture is going to be perfect he will not attempt to produce it. Now, this is all very fine from one stand-point, but from the stand-point of bread and butter it does not work at all. He has disappointed scores of people who have given him orders by not being able to supply the photographs at the time wanted, and the result is that he has never been able to advance beyond the preliminary stage, as far as volume of his work is concerned. He has a lot of artistic satisfaction in everything he does, but commercially speaking he is a failure.

In regard to the matter of carrying out instructions, the important thing is to notify the customer regarding the necessities which have imposed the change upon the photographer. As suggested above, most buyers are reasonable people, and if conditions are explained to them they will usually acquiesce without trouble. The thing that puts the photographer in a bad light is going ahead in apparent disregard of instructions and doing the work the way it was not to have been

done, that hurts. Getting an O. K. on a suggested change is one thing, and postmortems and explanations afterward, when the finished pictures are presented (together with invoices), are others.

Good service, of course, involves handling the office end of the work in a business-like, orderly way. Lots of photographers seem to be so busy with the mechanical details of their work that they are unable to attend to the proper entry of orders and the proper record of delivery of work, receipt of payments, etc. A photographer went into the office of a customer not long ago to solicit business, having nothing definite in view, and was embarrassed at the question of the customer regarding a print ordered several weeks before at a chance meeting on the street.

"I forgot," was all the photographer could say; and certainly this was not a good introduction to a solicitation for more business, for if he was not enough of a business man to remember or write down orders given him there was not much inducement for the customer to place other business in his hands.

There are other little points in connection with the service expected by business men—just as neat and attractive packing of finished work, delivery by messengers or errand boys hired by the photographer, etc.—but the things mentioned are the big features. If the commercial photographer who wants to succeed will give his customers service in those respects he will soon find that he is in demand everywhere, and that his customers are advertising him to their friends.

DIRECT POSITIVES ON BROMIDE PAPER

FOR rapidly copying documents, articles in journals, line drawing, etc., a direct photograph on bromide paper is very satisfactory if the photograph is made through a prism to avoid reversal. A well-known example is the use of the Photostat machine, in which the operations of development and fixing are performed automatically after exposure in the camera, the paper being cut off from a roll so that a great number of photographs can be taken in succession. This method, of course, produces a negative, and for much work a negative has no disadvantages. On most occasions, however, a direct positive is desirable, and such positives can be obtained on the bromide papers used for copying work by two different processes.

The first method is the well-known one whereby the developed but unfixed print is bleached out in an acid permanganate bath and the residual image of silver bromide exposed to light. This, on development, gives a positive black-and-white image. Good results are obtained by observing the following instructions:

The exposure must be sufficient so that development is complete in about two minutes, using the developer recommended for the particular paper used. After washing the print for five minutes it must be bleached by bathing for one minute in the following bleach bath:

Potassium permanganate	30 gr.
Sulphuric acid (strong)	150 min.
Water	32 oz.

Rinse and immerse in a dilute solution of sodium bisulphite to remove the brown stain, working in full daylight, and rinse and develop in the developer first used; then fix and wash in the usual way.

Any slight stain that remains in the print can be removed by bathing in a weak solution of potassium cyanide, being careful to take the print out the moment the stain disappears, or the silver image itself may be attacked.

A second method, worked out in the Research Laboratory of the Eastman Kodak Company, calls for developing in the usual manner, converting the unexposed silver bromide into silver sulphide,

and then removing the residual silver image, leaving a positive image of silver sulphide.

The exposure may be made in an ordinary plate-holder, keeping the paper flat with a sheet of clear glass, and must be adjusted so that development is complete in two to three minutes in the following developer at 70° F.:

Elon	8 gr.
Hydrochinon	150 gr.
Sodium sulphite, 3 oz.	100 gr.
Sodium carbonate, 3 oz.	100 gr.
Potass. bromide	50 gr.
Water	32 oz.

This developer will keep well.

It is evident in view of the fact that this developed silver image is subsequently removed, leaving a clear white background, that all the exposed silver bromide must be reduced to silver during development, or the highlights of the final positive will be stained or fogged. On the other hand, if the print is over-exposed in the first place, spreading may take place and fine lines will be lost.

After development a rinse only is needed before the print is put into the darkening bath, where it remains for two minutes at 70° F. when the unexposed silver bromide is converted into sulphide. The bath is made up of

Sodium sulphide (crystals), 1 oz.	330 gr.
Water	32 oz.

It will be safer to bring this solution to the boiling point and allow to cool before using, in order to precipitate the iron present. The final color of the print as well as the degree of contrast will depend on the strength of this bath, which may be used almost indefinitely. A weaker solution will give yellowish-green tones, but if the above strength of the solution is maintained almost black lines are ob-

tained. Rubber finger-tips should be worn as the solution may affect the finger nails.

The print, after a few seconds' washing, should be placed in the following bleach bath until the highlights are perfectly clear, which will occur in about three or four minutes:

Potassium ferricyanide	11 oz.
Ammonium sulphocyanate	11 oz.
Water	32 oz.

The temperature of the bleaching bath is important. It may run from 65° to 75° F., but it should not go beyond this or the silver image may be attacked and the bath is liable to decompose. The bath ripens with age and works best when it has turned a greenish color. Ammonium sulphocyanate may be replaced by the potassium salt without changing the action.

In view of the fact that ammonium sulphocyanate dissolves silver bromide, the print is automatically fixed during bleaching. After bleaching, the print should be well washed for five or ten minutes and dried as usual.

The finished print will have a slightly yellowish cast in the highlights, which can only be removed by continued use of the ferricyanide bath, which is not desirable. Local yellow stains are due to the presence of silver bromide along with the silver image previous to sulphiding. It is important, therefore, to prevent this by correct exposure and full development. At all stages of the process the print must be agitated to prevent stains caused by uneven action of the baths.

In actual practice the process takes very much less time than is taken to describe it. Not more than twenty minutes are needed to carry it through, including the developing, sulphiding, bleaching, and washing.

QUICK PROOF FROM A WET NEGATIVE. A correspondent suggests the following method: After fixing and washing the negative, it is hardened in formalin or alum, again rinsed for a few moments, and then the moisture removed by dabbing with a piece of clean soft rag. The negative is now put in an ordinary pres-

sure frame; over it is laid a sheet of thin celluloid, then comes the bromide or gaslight paper. Thus, between the dry paper and wet negative film is an isolating layer of thin transparent celluloid which keeps the paper dry, and also protects the wet film of the negative from injury.

ON TONE AND VALUES¹

By SADAKICHI HARTMANN

(SIDNEY ALLAN)

WE live in a tonal era. Every photographer aspires to it more or less. In Sarony's time, detail was the ambition and ideal of the professional photographer; today, it is the harmonious appearance of a print.

What is tone? Opinions, I fear, will differ largely. Trying to convey it in a few words, I would say: A pictorial representation in which all light and dark planes, all middle tints and gradations, from the darkest spot to the lightest light, are arranged in such a manner that they form an harmonious tint, in which nothing is obtrusive or offensive to the eye. A picture is "in tone" when it accomplishes this. Also, the painter will agree on this point, with the difference that he applies color notes instead of monochrome tints.

In order to realize a perfect tonality the values have to be correct. *Values* is an oft-misquoted word. It means nothing more nor less than the relations of the tonal gradations (of the various objects represented to each other).

Look, for instance, at the painting entitled "The Engraving," by Ambrose McEvoy (Fig. 4). In this picture the table-cover, the shimmer of the picture frame, the lady's dress, the color of her hair, the carpet, and wall paper, all had to be considered and arranged in such a manner that nothing would stand out too boldly. The painter was successful in subduing all minor interests to the principal figure without losing too much of the detail. This is what the writer of these lines considers a good example of tonal arrangement.

Tonal composition consists largely of a right sense of proportion, to understand the beauty of different degrees of tonality, the relation of tone in regard to size and shape against each other, and to bring all these possibilities into full play in each new effect. And this is largely

a matter of feeling, as the problem is a new one with every sitter. Just as the texture and complexion of the skin and hair, and the construction and expression of the face and head and neck, not to mention the color of the eyes and lips and the clothes, are different in every sitter, so the problem is a different one with every new exposure.

Few photographers nowadays apply as many distinct tonal variations as are in this picture. Formerly it was the fashion. When Davis and Sanford were at their prime, their gray platinum prints showed from sixteen to eighteen middle tints. They avoided black entirely. The result was that their prints gave the impression of a soft, refined gray, with any amount of subtle variations in the detail.

Our present convention pictures show that most men are satisfied with a simpler differentiation of values. It will be difficult to pick out in most pictures more than six or seven distinct tonal planes. The extreme tonalists, like the Secessionists, even go so far as reducing them to two or three tints. In many of Coburn's portraits you can trace only an exceedingly light tint and two middle tints. And in many of Kasebier's and Steichen's, and some of our advanced professionals, when they try to do the "artistic trick," you will find two or three flat tints in the face against an opaque background. They have fallen into the common error of mistaking darkness and monotone effects for tonality.

Tonality is possible in any shade from black to white. Fig. 10 is as good an attempt at tonality as Fig. 11. It is, however, difficult to convince people of this fact. The present trend, however, is for dark-toned pictures, and as the same laws apply to all tonal compositions I have chosen pictures of a dark tonality for my analysis.

Figs. 1 and 3 are both photographically possible. They are both what I would

¹ From "Composition in Portraiture."



1. "PORTRAIT OF MADAME B"
BY JULIUS STEWART
3. "MR. A. J. CASSETT"
BY MILTON LOCKWOOD

4. "THE ENGRAVING"
BY AMBROSE MCEVOY
2. "FANTASY"
BY P. G. TERRAS



6. "FLOWER GIRL"
BY SIR JOHN MILLAIS

7. "MAX KLINGER"
BY N. PERSCHIED

8. "PORTRAIT"
BY W. WEIMER

5. "BARON LAMBERT"
BY EMILE WAUTERS

call five-tone arrangements. Maybe some will count six tones, but there is no use of splitting hairs. In the portrait of Mme. B. you have the fine contrast of the dark dress and the flesh tints. This makes two. Then there is the gray tint of the hair, which is repeated in the fan. You will notice that this same tint also produces the shadows on the arm and neck, the embroidery of the dress, and some parts of the background. Besides, there is a fairly dark tint which makes up the largest part of the background and the highlights on the flesh tints. This makes five tones, and they are very ju-

diciously used, as they produce a decided contrast. In Fig. 3 you will find the same, only the tones are nearer related to each other and used with less variety in the juxtaposition. The result is that the portrait of Mr. Cassatt is more monotone than the other.

In Fig. 2, a photograph, we have four-tone arrangements. A flat middle tint all over the neck and face, with a vague shimmer of highlight, a dark bust, and a monotone background.

In Fig. 6 we have a picture that is "out of values." It may be different in the painting itself, but there is no doubt that



9. SELF-PORTRAIT

BY E. SCHNEIDER

10. "ANTOINETTE"

BY VON GLEHN

11. PORTRAIT

BY N. PERSCHIED

12. PORTRAIT STUDY

BY A. OFFNER

13. "BISHOP MALDENS"

BY RUBENS

14. PORTRAIT GROUP

BY A. GOTTHEIL

the effect is restless and confusing in the reproduction. The eye wanders about and is fastened on no point in particular. This is one sure sign whenever the values are incorrect. Another is, if the eye goes at once to one point which should not be the principal attraction. In the portrait of the boy (Fig. 8) the collar is too prominent and the flesh tints of the boy's face a trifle too dark. The tonality suffers thereby. In the portrait of Max Klinger (Fig. 7) it is not so much the collar as the ear. In Fig. 5 neither the hands, the books, nor the back of the chair are in tone. A painter may possibly render this diversity of objects interesting in color, but it would be difficult for a photographer.

Simplicity and omission of unnecessary accessories will be the best helpmates toward accomplishing tonality in ordinary photographic portraits, such as most people demand. Lack of tonal gradations

seems to me just as unwise as the multitude of shades and tints of former years. Figs. 11 and 14 represent excellent tonal arrangements, but they are, after all, a trifle dull for portraits. In Figs. 9, 12, and 13 there is more contrast, more juxtaposition of light and dark, and, for that very reason, more life, more vitality. The picture grows in interest.

I cannot repeat often enough that it is, after all, the face which we want most in a portrait. In the flat-tone treatment all the beautiful modelling is lost. In the Ruben's portrait (Fig. 13) we have modelling first of all, the tonal variation is largely in the face, the subtle tints melt almost imperceptibly into each other, and yet show the construction, the texture of the face, and the character of the man. And yet the picture is perfect in tone.

PRODUCING PHOTOGRAPHS IN BLACK SULPHIDE OF SILVER

By "CHEMIST"

IT is well known from a chemical stand-point that the sulphides of silver are bodies that possess great permanency. Silver, being a metal that readily combines with sulphur, produces two sulphides, one a brown and the other, the principal one, a black, represented chemically Ag_2S . This body is found when sulphuretted hydrogen is passed through a solution of nitrate of silver. The precipitate that is found is a very intense black powder which is found to be almost unchangeable, yielding only when submitted to an intense heat. It has been remarked many times that if photographs could be produced in black sulphide of silver such pictures would rival platinum for permanency. It is intended here to show how portraits or views or the copies of engravings can be produced in black sulphide of silver. Any subject drawn in line can be reproduced properly, every dot or mark, short lines, and every mark set in a picture by the engraver can be rendered with perfect fidelity, while in portraiture the drapery and half-tones show up in a manner that differs from any other silver process. Some years ago a process known as the collodion transfer process was brought into use to a very large extent. The image was made upon a clean washed sheet of glass, developed with a solution of pyrogallic and citric acids, fixed in a solution of hyposulphite of soda, well washed, then transferred to a sheet of stout, smooth paper by means of a gelatinized surface. The paper was squeegeed down upon the collodion image, with the gelatin solution intervening. It was then allowed to dry, after which it could be lifted from the plate with the collodion image adhering. This kind of portrait formed an excellent basis for painting upon in oil colors, and at one time was in great demand. To obtain pictures in sulphide of silver it will be necessary to work upon somewhat similar lines, although in one method to be described the silver may be entirely removed from the

glass plate, then transferred to paper, either in the usual position or reversed.

It will be necessary in the first place to provide the necessary utensils and appliances. These are not at all expensive, and when once set up pictures may be produced with ease and certainty. The process being worked with wet collodion, it will be necessary to provide a glass dipping bath to contain a solution of nitrate of silver, also a dipper upon which to rest the plate when it is lowered into the nitrate of silver solution. The glass dipping bath and dipper can be readily obtained at any large photographic stock dealer's. A list of the necessary material is given herewith to enable any one desirous of practising the process to commence right and be sure of success from the commencement.

List of Materials, Chemicals, and Utensils Necessary

Three dozen sheets of double transfer paper.

Half a pound of nitrate of silver, c. p.

Two pounds protosulphate of iron.

One pound photographic alcohol.

One 8 x 10 glass dipping bath and dipper in wood case.

One pound sulphuric ether, sp. gr. 720.

One ounce pyroxiline.

One ounce castor oil.

Half pound India-rubber cement.

Half a pound of "benzole."

Half pound sulphide of ammonium.

One gallon distilled water.

Half pound iodized collodion.

Two ounces nitric acid, c. p.

One pound acetic acid.

Two dozen pieces of plate glass from 4 x 5 to 8 x 10, about three thirty-seconds of an inch in thickness.

Half pound strong water ammonia.

Half a pound of sulphate of copper.

Four ounces of bromide of potassium.

One ounce white wax.

One glass funnel (plain), 6 inches diameter.

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One glass funnel (plain), 3 inches diameter.

Half pound absorbent cotton.

Two dozen filter papers.

One hydrometer, for testing the nitrate of silver and other solutions.

Having the above material, etc., at hand, make up enough silver solution with nitrate of silver and distilled water to nearly fill the dipping bath, which will probably be about thirty-five ounces fluid measure. When the nitrate of silver is dissolved (which should be about three and one-half ounces), test the solution with the hydrometer. The strength should be from 35 to 40 upon this instrument, which means thirty-five to forty grains of nitrate of silver to one fluid-ounce of distilled water. Having made up this solution in a clean bottle, add one fluidram of c. p. nitric acid. Then shake the bottle well. This sensitizing bath must be very acid, so that extremely clear transparencies or diapositives may result. Just as soon as the solution has been acidified clean out the dipping bath well, then pour into it the silver solution just prepared. Now coat a clean glass plate, 5 x 7, with the iodized collodion. The coating is done by pouring a small pool of the collodion upon the middle of the plate; then, by tilting the plate until the collodion has flowed to each corner, drain the excess back into the bottle. Allow the plate to stand for half a minute, then place it upon the dipper and lower it into the nitrate of silver bath. The plate must remain in the bath, say, all night. This is to allow a small quantity of the iodizing salts to dissolve into the silver solution. The next day the plate must be removed. The silver solution is now ready for use. This bath must be left covered when not in use. Now prepare the following collodion and mixing solution, which is to be used especially for this particular work:

Stripping Collodion

Alcohol (photographic)	3 oz.
Pyroxiline (gun cotton)	25 gr.
Sulphuric ether (720)	3 oz.
Castor oil	18 drops

Add the pyroxiline to the alcohol, then the ether, when, after well shaking, add the castor oil.

Waxing Solution

Sulphuric ether	2 oz.
White wax	20 gr.

Cut the wax into thin shreds, add to the ether. Cork the containing bottle tightly. Shake the mixture until the wax has become dissolved. Label the bottles containing the above preparation. "Stripping collodion" and "waxing solution." Mix in another bottle two ounces of rubber cement and three ounces of benzole. Be sure that the benzole employed is what is known as coal-tar benzole, not the benzine made from petroleum. The solvent action of the tar benzole, the true C_6H_6 , is infinitely superior to the other. This may be set aside ready for use after thorough admixture. Now make up the following solution for developing and intensification of the image:

Iron Developer

Protosulphate of iron	$\frac{1}{2}$ oz.
Distilled water	16 oz.
Acetic acid	$\frac{1}{2}$ oz.
Alcohol (photographic)	$\frac{1}{2}$ oz.

For intensification make up a stock solution of ten or twelve ounces of sulphate of copper in one bottle, of the strength of 70 on the hydrometer. Also a solution of bromide of potassium registering 35 on the hydrometer. These solutions will keep indefinitely if kept in separate bottles. The developer will act at its best when a day or two old. Thoroughly clean all the glass plates by washing them in a warm solution of common washing soda. Rinse them under a faucet, place them in an acid bath composed of muriatic acid, one ounce to water forty ounces. Make up a mixture of the albumen of one egg to thirty-two ounces of distilled water. Filter the same after adding one dram of stronger water ammonia. Pour some of this into a four-ounce graduate; then take the plates one by one, rinse them under the faucet, drain for a moment, and pour a small quantity of the albumen mixture over the plate. Drain off the excess, then place the plate in a clean rack to dry. In preparing these plates see that the albumen is poured over the smooth surface, which is almost invariably that opposite the one over which the glass

cutter ran his diamond. About half the number of pieces of glass plates may be prepared in this way, then placed aside for use. The remainder of the plates, or as many of them as may be required for immediate use, must be prepared as follows:

Waxing the Plates. Clean well the plate intended for use by draining off all the moisture, then rub dry with a piece of clean white rag. Take a piece of rag, fold it up into a little bunch by bringing the four corners together. Moisten the centre with a small quantity of waxing solution, then rub this well all over the face of the glass plate. Polish the plates off with a clean rag. Place them in such a way that their waxed surfaces are protected from injury.

The glass plates now being ready, proceed to make a picture for direct transfer from the glass by coating a waxed plate with the iodized collodion, draining the excess into the collodion bottle, taking care to rock the plate backward and forward while the collodion is draining, so that the film will be even. This done, place the plate upon the dipper and lower it with one steady movement down into the nitrate of silver bath. (Of course, these operations are performed in the dark-room.) Allow the plate to remain in the bath for about two minutes, or three minutes will do no harm. After this, remove the plate, taking care to handle it by one corner only, or, if it can be spanned by the thumb and middle finger of the left hand, then remove it by this means. Stand it by corner upon a piece of blotting paper. Then wipe the excess of nitrate of silver off the back of the plate with a piece of soft blotting paper.

The plate is now ready to be printed from the negative, which has previously been varnished and provided with a mask of waxed paper covering about three-eighths of an inch of its surface on all four edges. The negative is now placed in a printing frame with its varnished and masked side uppermost, and the plate still wet with nitrate of silver is placed in contact upon it. All this work in the dark-room should have been done under an amber light.

Lay over the plate a pad of black cloth.

Fix the back of the panel and make the required exposure. If an incandescent lamp of 16 candle-power be used, stand the frame away from the light about four feet. Twist the frame around during the exposure two or three times, and count eight seconds. Turn down the light, open the back of the frame, remove the plate, pull off the mask if it sticks, then as quickly as possible pour over the wet surface of the plate a small quantity of the iron developer. Holding the plate by one corner by the finger and thumb, the developer must be poured on from one end in one continuous sweep. About one ounce of developer is all that is required to do this. Rock the plate so that the developer and wet silver solution pass to-and-fro over the surface two or three times. The image will quickly appear. Just as soon as it is only moderately well out wash it at once under a gentle stream of water from the faucet. Take care during this operation, or the film may become injured. The moment the plate has been covered with water the light may be turned up or a window opened, for once the developer has been washed off the plate it is no longer sensitive to light. All the operations that follow may be performed under ordinary light. As soon as the plate is washed, which is accomplished in half a minute, it must be fixed, and although a concentrated solution of hyposulphite of soda may be used for this purpose, a mixture of cyanide of potassium of a strength of twelve grains to one ounce of water is yet better. This may be poured over the wet surface and returned to the graduate, or, better still, a small wide-mouthed bottle of about six-ounce capacity. When the picture has become clear, that is to say, when all the iodide of silver has been dissolved out of the film, it must be washed again in a very gentle stream of water for half a minute. Stand the plate aside by laying it down, face uppermost, upon the top of a graduate, then mix the following:

Bleaching Solution

Sulphate of copper solution at 70 2 oz.
Bromide of potass. solution at 35 2 oz.

Pour this mixture upon the plate two or three times, returning the excess to the

bottle. The image will become intensely white. Wash the plate well after this for about one minute, then pour over the bleached surface a solution of nitrate of silver of the strength of ten grains to the ounce of distilled water, returning the excess of solution to the bottle. The surface of the bleached image will now become a dark-gray color. Turn the plate over, see that it is uniformly gray. Wash for half a minute, and then make up the following mixture to convert the silver image into sulphide of silver:

Sulphide of ammonium . . .	1 oz.
Water (ordinary) . . .	4 oz.

(This mixture should be made and used outside the dark-room, because of the smell of sulphuretted hydrogen that is given off.)

Pour a little of this mixture all over the plate, drain the excess off down the sink, and wash well under the faucet. The entire image upon the plate is now converted into the black sulphide of silver. Just as soon as this has been accomplished pour over the plate a mixture of nitric acid, 1 ounce, water 6 ounces. This is to keep every part of the high lights quite clean and clear, because it will be seen that the print that has been obtained from the negative is a wet collodion diapositive. While the image is still wet, or only surface dry, a piece of the double transfer paper should be soaked in cold water for several minutes, then placed into warm water until the surface feels slightly slippery. The plate is then flooded with cold water, and the transfer paper laid upon its surface with the film side down. Grasped by the two top corners, they are held so that the water runs from between them. In this position they may be clipped and suspended to dry. As soon as dry, which will take several hours, the plate may be warmed slightly, when the collodion film with its sulphide of silver image will leave the glass and be transferred perfectly to the sheet of paper. It will consist of pure whites and blacks, and will present all the appearance of a carbon print with a collodion surface. The picture will be reversed, unless it is made from a reversed negative in the first

place, or by using a film negative, then making the collodion print from the reverse side.

If prints are to be produced which can be stripped from the plates and mounted independently they must be made upon the albumenized plates previously described, as follows: Proceed to collodionize one of the albumenized plates the same as before, and sensitize it in the nitrate of silver bath. Carry out the process of making the exposure in the printing frame, then develop, fix, wash, and intensify as before described, and transform the image into sulphide of silver by a wash of diluted sulphide of ammonium. Also flood the plate with a weak nitric acid solution, then wash well and allow the plate to become perfectly dry. It must now be poured over the entire surface of the image with the thinned down rubber cement, allowing the excess of solution to drain back into the bottle. Then place it in a clean rack to dry. Just as soon as it is quite dry, which will be in about half an hour, this rubber film must be flowed over with stripping collodion, this being accomplished in the same manner as described for coating the plate, draining the superfluous collodion into the bottle. The plate may now be stood in a rack and put into a warm place to become perfectly dry. As soon as the drying is complete take a penknife and cut the film in a straight line at the sides and ends by using a small straight-edge. Cut the film to a size slightly larger than required when finished. Now place the plate in a tray containing a mixture of acetic acid 4 ounces, water 6 ounces. Allow the plate to stand in this liquid for about five or ten minutes. It will then be found that by lifting one corner of the cut film by the tip of a knife the film can be lifted completely off the glass plate. It should at once be placed in a tray of clean water to wash off the excess of acetic acid, then laid down upon a piece of double transfer paper that has been softened as previously described. The film may then be pressed carefully down upon the softened surface by means of a small squeegee made of a very thin piece of sheet India-rubber, carefully pressing the film down from the centre, drawing the

squeegee gently to the sides so as to wipe out all excess of liquid. The print may now be suspended by a wood clip to dry. When dry it may be trimmed and mounted just the same as any ordinary photograph.

The film that has been removed from the glass is very tough and strong. It can be handled freely without fear of injury. In some cases it will not be necessary to intensify the image; for a portrait, intensification is best omitted. It will also be seen that when the film has been removed from the plate it can be transferred to its final support in the correct position. The object of stripping is to accomplish this purpose. Although this description of producing photographs in sulphide of silver may seem somewhat lengthy, it will be found in practice to be comparatively easy, the

various operations requiring no longer time than is usually occupied in the production of carbon prints, which process it resembles in many particulars.

The whites of the transferred film will not be quite so brilliant as in the print transferred direct from the plate, because of the slight color given by the rubber varnish. The color is, however, very slight, and does not prove at all detrimental to the finished picture.

These intensely black sulphide of silver photographs can be transferred to porcelain or opal glass in just the same manner as to paper, using a very thin substratum of gelatin, of a strength of twenty grains of gelatin to one ounce of water, or allowed to remain upon the glass plate upon which they were developed to form a perfectly black-and-white transparency.

MASTERS IN PORTRAITURE—JOSHUA REYNOLDS

REYNOLDS was not only one of the greatest, but also one of the most successful painters England produced in the eighteenth century. He was a contemporary of Hogarth and Gainsborough—indeed, two worthy competitors—but Reynolds eclipsed them in fame as well as wealth. He was the most popular of the three, surely during his lifetime, and even now he holds his own with any of the English masters. He is considered the founder of the so-called English School. In his biography we read that he earned £6000 annually, and that he left one million and a half to his heirs. The term "poor artist" surely did not apply to him.

He is best known as a portrait painter. He was a successful and an accomplished master at an age when most painters still study or struggle for professional and social recognition. He painted nearly everybody of consequence, and with such ease, that he frequently finished sixty to eighty portraits within one year.

The English aristocracy was always used to good portrait painters. Holbein, Van Dyck, Rubens, had established a standard of rare excellence, and it was quite natural that Reynolds built up his style on the Old Masters.

In his *Analysis of Beauty*, he wrote that there was only one entrance gate to the study of nature, and that the key was owned by the Old Masters. He acknowledged himself that he had learned the largest part of his wisdom and facility of expression from Titian and Tintoretto, Correggio and Veronese, Guido Reni and Velasquez. But he knew how to amalgamate their traits with his own individuality.

As we look over the accompanying illustrations we are struck by dignity of pose and elegance of arrangement. Reynolds was at times an exquisite colorist, although Gainsborough was his superior in that respect. This, of course, is lost in the reproductions, but the local values are fairly well rendered, and it is this quality which is particularly interest-



1. TWO NOBLEMEN
2. DUCHESS OF DEVONSHIRE

3. UNKNOWN LADY
4. VISCOUNT ALTHROP

ing in his work. There is always subtlety and contrast. Notice Figs. 1, 2, 5, and 9 in particular.

Fig. 1, the "Portrait of Two Noblemen," is an excellent two-figure composition. By painting one figure in a dark dress and the other in a lighter one, he produced a fine division of space. The light spots of the pictures and hands balance the two luminous faces. The background is an excellent example of simple handling. It seems to me that Reynolds was more successful in his plain than his elaborate landscape backgrounds. The latter are a trifle over-done (*vide* Figs. 2, 4, 6, 8, and 12). Are not

Figs. 3, 5, 7, 9, 10, and 11 much finer? The composition in Fig. 1, could have been improved if the head of the darker figure were a trifle higher than the other. It would have produced a better diagonal arrangement.

Unusual light effects are another characteristic of Reynolds' paintings. Notice, for instance, how the light strikes the face and certain parts of the dress, leaving the rest in semi-shadows. It is natural light effect that explains itself. Just that way early twilight strikes objects through a vista of tree trunks. One even notices the shadows of branches on the arm and waist. We notice, a similar



5. MISS BOWLES
6. THE CREWE SISTERS



7. STRAWBERRY GIRL
8. MRS. HARDINGE



effect in the "Young Viscount" (Fig. 4), standing under a baldachin. How they ever arranged such drapery effects in the open we do not know; it looks a trifle absurd. But the light is correct; it strikes the figure from the front and above, coming from the right side, as is plainly seen in the hand and the book.

Fig. 3 is an ordinary good portrait of the triangular construction. The inclination of the head, always effective in a full-face view, the slight turning of the bust toward the left, the arrangement of the hair, and a due regard to the textural qualities of the dress lend special charm to the picture.

Texture is one of the strong points in Reynolds' work, particularly so in some of his portraits of children. It is evident in Fig. 5, and still more so in Fig. 7,

which could pass for a Rembrandt. Fig. 5 is photographically possible, but the particular surface charm of the little "Strawberry Girl" (Fig. 7) could be produced by hand manipulation. The background in Fig. 7 is almost too opaque, but it helps to accentuate the glimmer of light on the dress.

Reynolds favored the triangular arrangement in the majority of his portraits. We notice it in Figs. 5, 8, 9, and 12; it is even noticeable in Figs. 6 and 10. The pyramid shape of human figures is always effective, particularly for bust portraits and the ordinary upright size.

In Fig. 6 the different height of the heads helps the composition considerably. The figures are well placed, but somewhat small for the allotted space. There is too much landscape for a por-



9. COUNTESS SPENCER, 1784
10. COUNTESS SPENCER, 1782

11. LADY BINGHAM
12. MRS. HYDE

trait, the trees are too conspicuous, and yet the arrangement is exceedingly well balanced. This is due, it seems, to the flow of drapery and the picturesque pose of the arms. And, after all, the two figures, despite detail, make up the largest plane, and for that reason dominate the note of black and white contrast in the background.

Reynolds always put special stress on the management of hands. They are very beautiful, but idealized. They always have the same perfect shape and languid droop. They are not characteristic of the sitter except in pose and gesture, and in that respect furnish valuable material to the student of composition.

"Mrs. Hardinge" (Fig. 8) is an excellent example of line arrangement. Everything is round and soft and seems

to flow in beautiful curves, although the lines themselves have a tendency of being straight and angular; but they never come to an abrupt point. The scheme of line is carried out through the whole composition: It starts with the hair, and the same curves are repeated about the shoulder, the waist, in the folds of the sleeves, the hands, and the skirt. It even influenced the vista of light in the background. We do not believe that such arrangements are possible with our modern costume. It may be possible to imitate this particular picture, but it is quite a different problem to invent a new one which would hold its own with this picturesque arrangement.

Figs. 9, 10, and 11 are three simple bust portraits, about as well managed as can be imagined. Fig. 9, the "Countess Spencer," is particularly noteworthy for

the simplicity of arrangement, the facial expression, and textural charm. It is astonishing how well this painter managed, in nearly all instances, to concentrate the light upon the face and the principal parts of the body. And yet, as we remarked at the start, the lighting is quite out of the ordinary. It throws distinct shadows, emphasizes the modelling and principal features of the face, and yet is diffused. Look at the shadows under the brim of the hat and under the nose in Fig. 10; how distinct and yet how transparent they are. Notice the touches of light on the nose, upper lip, and around the mouth in Fig. 11. Reynolds' light has the true vibratory quality that illumines the face with vague accents, emphasizes the features here and there by a dark passage, and gives a vague shimmer to the shadowy parts.

Reynolds' popularity with his sitters was largely due to his comprehension of

public taste and his willingness of meeting his audience half way. He was always ready to make concessions. He was not above making a "pretty" picture, as Fig. 12, but he always did it in such a masterly fashion that even the connoisseur finds it easy to forgive certain shortcomings. For instance, he never objected to the introduction of all sorts of unwieldy paraphernalia, as dogs, fancy costumes, and all sorts of cumbersome and story-telling objects. He simply made the best of them. He was such a master of composition that he generally managed to subdue them. And in many they proved a valuable adjunct, as they lend an additional richness and picturesqueness to his arrangements. His portraits have an air of completeness about them that is as rare as it is fascinating. Each of his paintings is a lesson in composition and worthy of the closest analysis.

A PATCHY appearance of the developed carbon print may be caused in consequence of the surplus water not being blotted off the tissue when it is squeezed into contact with its support previous to development.

THE easiest way to save money is to make more than you spend.

It is impossible to state all the good things which can be said about any article of business in a single advertisement.

It is not generally known that rich, warm tones, varying from Bartolozzi red to standard brown, may be obtained by development alone on most of the brands of gaslight paper now on the market.

Warm sepia can be secured with uniformity by trebling the requisite exposure for black tones and by diluting the orthodox metol-quinol developer with three times its bulk of water. The development should be stopped immediately the desired tone is reached, when a rich print should result, free from the washed-out appearance so common with many methods recommended for obtaining warm tones. By quadrupling the exposure and further diluting the developer a good Bartolozzi red may be got. A variety of colder tones are at command by varying the exposure above the normal and by dilution of the developer in proportion.—*Photography*.

PHOTOGRAPHIC SECTION

ACADEMY OF SCIENCE AND ART OF PITTSBURG, PA.

OFFICERS

O. C. REITER, President, 2424 Penn Ave.
D. R. BREED, V.-Pres., 123 N. Dithridge St.
C. E. BEESON, Sec'y-Treas., Frick Bldg.
S. A. MARTIN, Print Director,
923 Chislett St.
W. A. DICK, Lantern Slide Director,
910 Chislett St.

EXECUTIVE COMMITTEE

NORMAN S. WOOLDRIDGE
WALTER C. MELLOR
THOS. REED HARTLEY

MEETINGS AND EXHIBITIONS
CARNEGIE INSTITUTE

THE PITTSBURG SALON MARCH 1 TO 31

OF the several committees which go to make up the Salon management the most important is undoubtedly that body whose duty it is to select from among the exhibitors those who show the proper qualifications for membership in the Salon.

Upon their judgment and discretion depends the future of the enterprise; for if they select unwisely the personnel of the membership at once deteriorates and consequently ceases to attract that class of worker without whose support any attempt to perpetuate an exhibition worthy of the name "Salon" would be futile.

"The Jury of Selection," that body which determines what pictures shall and what pictures shall not appear on the walls of the Salon are confronted with a task no less important than the office mentioned above, yet an oversight on their part is in a sense temporary in its effect as compared to the same action on the part of the Salon committee.

However, at this stage of the proceedings, time is at a premium, and the work of the preliminary jury must be finished at the earliest possible moment, so that the hanging committee, the catalogue committee and the various other bodies may complete their work and have everything in readiness when the opening day arrives. During this season of feverish

haste and excitement there is little wonder if occasionally a good print fails of recognition or a commonplace article accidentally slips past the guard and looms up on the walls to the chagrin of the management and the everlasting joy of the "Knockers."

It should be remembered that Art juries possess the same peculiarities of human nature which characterizes juries in the commercial and legal world and nowise have they reached that state of perfection in operation which insures the punishment of the guilty or the acceptance and glorification of the worthy.

In the deliberations of the Salon jury the past and probable future of the candidate as a pictorialist is taken into account and carefully considered; but particularly do they endeavor to guard against admitting to membership one whose sole claim rests upon a single example, however excellent that example may be. Rather is it more profitable to elect one whose work shows consistency, even if no individual exhibit possesses quite the "class" of the picture shown by the one-print man.

By the observance of these and other rules the membership, though seemingly slow in growth, has gained in strength each year, and each succeeding exhibition is convincing in its superiority over the preceding ones.—W. H. P.



Professional Photographers' Society of New York

THE THIRTEENTH ANNUAL CONVENTION WILL
BE HELD AT THE HOTEL MCALPIN, NEW
YORK CITY, FEBRUARY 26, 27, 28, 1917

THE leading features will be: Special exhibit of prints by Haley, Clarence H. White, William Shewell Ellis, Hoyt, MacDonald, Buxbaum, Noetzel, Mock, Miss May L. Smith, Clifford Norton, Frank Scott Clark and others; then the members' exhibit of the *one best* print made during the year; practical demonstrations by Miss Smith, J. E. Mock, J. P. Haley, and others; business talks by Pirie MacDonald; talks on System by George W. Harris and Frank H. Cole, of Cole & Co., Asbury Park; "Pop" Core has consented to show several stunts that he found practical in his business; the Edison Company, through Mr. Garrabrandt, have offered the use of their electric studio. Every member present will be called on for a five-minute talk. Last year this feature proved to be such a success that we are going to repeat it. There are other features that are being prepared which at this time cannot be announced. We want each member to assist in making this convention the best ever. Of course, there will be the annual banquet and dance.

For twelve years the New York conventions have been most successful—one great big family gathering where friendship and ideas are renewed and exchanged. We want each member to assist us in making this, the thirteenth annual convention, the most successful yet held. Make your preparations to attend. You cannot afford to miss it.

E. L. MIX, President.

The Studio and Its Proprietor

SOME studios seem to run automatically. The pushing others need is so obvious, looking at it hurts. What makes the difference?

Some men work because work makes them happy; others find no joy, but tiredness and bother in the necessity for effort. What makes the difference?

His studio, in its appearance, its management, and its success or failure, reproduces with infallible fidelity every lineament of its owner's

character. *It is the concrete expression of his habit of thought and action.* That it is what makes the difference.

His attitude toward work and toward others is the combination to that innermost chamber of himself. He cannot be lukewarm to others and cold to work and not in the end find all life's gladness frozen against him. That it is that makes the difference.

It is not fate. It is not luck. It is not something over which you have no control. It is something that every man can mold and build upon. But you've got to do your building even more regularly than you open the studio and never take a vacation from it. For it is character that makes the difference.

The New Panchroma Combination Lamp for Professional Portrait Photographers

IN the new model H series the resistance is mounted on the lamp itself, thus permitting the removal of the toplight from the stand for use independent of the stand, such as hanging above the setting. Another important improvement is the new switch box which is fused throughout. This improvement is an invaluable time-saver and has been called one of the most advantageous innovations.

Especial attention is drawn to the lamp shells or reflectors which have been improved to such an extent that undue heating is avoided and the reflecting surface thus kept in condition for many months. An exclusive feature of the new shell is the device by which the carbons may be renewed without detaching the shell from the lamp. This, too, is a time saver.

Great attention has been paid to the scientific construction of the reflecting surfaces so that the light is evenly distributed over a given area designed to be covered, gradually diminishing so that additional units may be used and the light perfectly blended where the rays join. Additional reflectors are supplied, which may be attached to the lamp while in position, so that the operator may spread the light over a large surface or concentrate it upon a small space. The lamp is not a spot light under any circumstances. By giving the operator a great range of usefulness the manufacturers are trying

to place in the hands of the motion-picture maker the greatest volume of actinic light with the least possible trouble for the electrician and the director.

The lamp furnishes 12,000 candle power of pure actinic light, pleasant to the eye and consuming 25 amperes at 110 volts. It is mounted on a balanced stand with easy adjustment from the floor to 9 feet 10 inches high—and can be wheeled into any position. Full information will be furnished by applying to the Allison & Hadaway Corp., 235 Fifth Avenue, New York City.

Motion-picture Portraits

By applying the principles of motion pictures and of modern enlargements on paper, Mr. G. Bettini, of New York City, has evolved a new system of photography which is revolutionary in many respects. The inventor states that all the expensive apparatus in the professional studios will be unnecessary when his camera is introduced, and in portrait work, because of the certainty of natural expression selected and the simple manner of controlling the light effect, the average amateur will be able to make artistic portraits quite as readily as the foremost professional.

The new process consists of nothing more than the taking of motion pictures of the subject while the latter is assuming a number of natural poses, then developing the negative and printing a positive from it, followed by the projection of the positive for the subject so that a selection of poses may be made, and finally the printing of the desired photographs on paper to any size desired.

For his photography Mr. Bettini depends upon a motion-picture plate camera. At the rate of about twelve per second, the various poses assumed by the subject are photographed on a standard glass plate negative in horizontal and vertical rows, the plate being sufficiently large to take something like 500 or more exposures. Each exposure or image is $\frac{1}{4}$ or $\frac{3}{8}$ inch square, the former dimensions being that of the existing camera, while the latter will probably be that adopted for the commercial cameras. When the camera has recorded the series of poses, the negative is removed from the light-proof magazine and developed in the usual manner.

A positive glass plate or lantern slide is then made from the negative, and the subject then has an opportunity of seeing himself on the motion-picture screen, just as others see him. Since the glass plate is non-inflammable, the subject can have the motion-picture projector stopped at any desired point. Thus a selection is made of one or more poses, and by means of two indices—one for the horizontal and one for the vertical rows—the operator can make a note of the images approved of.

The photographer then returns to the negative, which he places in an enlarging machine. The latter, in its main essentials, is a counterpart of the projector; in fact, the projector may as well be employed for this purpose if there is no occasion to use both machines at

one time. Referring to the notations of the poses selected, the photographer brings the desired image into position by adjusting the pointers on the horizontal and vertical indices which correspond to those on the projecting machine. The enlarging process now resolves itself into the usual procedure. The powerful arc lamp is turned on; a piece of plain paper is placed on a stand in the path of the rays of light, in order to focus the negative image properly; and finally the sensitized paper is substituted for the plain paper and the exposure made.

Because of the tremendous enlargement which is occasioned by the employment of so small a negative for so large a print— $7\frac{1}{4}$ by $9\frac{1}{4}$ —the inventor has had to overcome the appearance of prominent grain in the print, particularly when fast plates are employed. Mr. Bettini has solved the problem by causing the rays of the enlarging machine to pass through a piece of silk bolting-cloth, held between two sheets of glass, just behind which is placed the sensitized paper. The fine screen thus interposed effectually destroys all traces of the coarse graining, and its mesh is barely discernable in the enlargements. Naturally, the screen necessitates a longer exposure for the paper, but this is not a troublesome feature to contend with when one is dealing with seconds.

The finished prints made by the new process have the soft, harmonious effect that is so much in vogue among leading photographers today, and despite the intense enlargement the amount of detail demanding attention is surprisingly high.

But most commendable of all is the naturalness—unusualness, one might say, since naturalness is such a rarity in studio photographs—of the expressions and poses, for the subject has been photographed at moments when these were beyond voluntary posing. Finally, it should be remembered that in this new process the subject is not obliged to assume a number of expressions and poses under the guidance of the photographer; instead he smokes, laughs, reads a letter, and chats with the photographer while the camera is recording every move that he makes. "Painless photography" is what we are tempted to call it.—*Scientific American*.

A New Process of Stellar Photometry

A NEW process of stellar photometry has been developed by Mr. H. T. Stetson at the Yerkes Observatory. At present the common photographic method of determining the brightness of a star involves measuring the diameter of the image on the photographic plate. One serious difficulty in this process is due to the fact that the images show no well-defined periphery, so that the diameter is more or less uncertain. The difficulty is augmented if the images are elongated or poorly defined. Another method is that of extra-focal images: The plates are placed at a considerable distance from the focus of the telescope, and under these conditions the star disks are all of appreciable the same size, but differ in opacity, and

the latter is determined with a calibrated photographic wedge, by means of a Hartmann micro-photometer or other similar device. The principle involved in the new method is to measure the energy absorbed from a beam of light by the silver grains in the stellar image on a photographic plate, and to interpret such absorption in terms of stellar magnitude. A thermopile is so placed as to receive light from a constant source, and in the path of the light is placed the star image, on the photographic plate. The image thus stops an amount of energy depending upon the magnitude of the star. The apparatus is also adapted for measuring opacity of the image in extra-focal photographs, and for measuring relative intensities in plates of stellar spectra. The principal sources of error in this process appear to be variations in atmospheric conditions during exposure at the telescope and irregularities in the photographic plates, but it seems to mark a distinct advance over the method of measuring diameters of star images. As compared with the use of the selenium cell and the photo-electric cell, Stetson's process is applicable to a wider range of star magnitudes. A special thermopile was devised for this apparatus by W. W. Coblentz, of the Bureau of Standards.

"Twelve Things to Remember"

The value of time.
 The success of perseverance.
 The pleasure of working.
 The dignity of simplicity.
 The worth of character.
 The power of kindness.
 The influence of example.
 The obligation of duty.
 The wisdom of economy.
 The virtue of patience.
 The improvement of talent.
 The joy of originating.

A Notable Collection of Photographs from Spain

At the Hispanic Museum in New York is an exhibition of photographs of rural Spain by Anna Christian, the interest of which will be greatest to those who know something of the conditions under which the work was done. Miss Christian, in addition to her thorough training as a photographer, has two years of architecture at Columbia University to her credit. This has given her a point of view extremely valuable in presenting architectural subjects and in selecting the artistically significant. Her work in Spain resulted in some six hundred photographs from the many sections and states into which this country is divided. These commemorate the traditions persisting through centuries with a home-staying people. There is no apparent reason why Galicia should continue to build long and narrow houses and Asturia square houses, except that they have done so in the past. There is no reason that Valencia should throw her grapevines over the fore porch of her homesteads and keep the charming habit to herself. These and other differences are noted in Miss

Christian's photographic record and add to its importance.

Many of the places she has photographed have never been published to the outside world. The Spanish resemble the Moors in declining to admit men into their houses, and only a woman could have obtained access, but the woman attempting the tour of the Spanish rural districts must have the hardihood of a strong and determined man, for the discomforts have persisted together with the traditional architectural features.

One series of photographs is particularly interesting in showing what is practically trench life. Godella, Valencia, is an underground town, the chimneys of which are on a level with the surface of the earth. The houses are approached by a graded entrance, such as travelers occasionally choose to climb in the Pennsylvania Station. A roof of barbed wire is used to prevent strangers from climbing down into the houses. Pigs and chickens share house room with the people, who depend for light and air upon the overhead openings, and who roll up their bedding in the daytime and pile it where the sun can reach it. All this picturesqueness is displayed in the photographs, together with beautiful details, such as the ornamental wrought-iron case in which water jars are kept in this town, but not in others.

The cave dwellers or gypsies of Andalusia also are an underground people, but they have a simpler method, burrowing into the side of a hill. Miss Christian has photographed these rooms hung with cages for birds, of which the Spanish gypsy is passionately fond. She has photographed the house barns of northern Spain on their stone stilts, the rock houses of Pyrenees, the Muir bulls undergoing tests for courage. (This last subject called for a guard of forty men to protect the intrepid artist.) She has shown palaces and workhouses, the homes of rich and poor, which never before have been photographed. The artist, Sorolla, with whom she stopped during much of her stay in Spain, obtained introductions for her, and eagerly furthered her efforts to place on record an already passing civilization. One of the photographs testifies to the need of haste, the picture of the Casa de Miranda in Borgas, rich in superb Renaissance decoration, and now used as a slaughterhouse, the Frenchman who owns it not being permitted by the authorities to remove it from the country.

Miss Christian has sold one set of her pictures to Arthur M. Huntington, and others are owned by the Hispanic Museum. They are museum material of an important kind.—*N. Y. Times*.

Burke & James, Inc., Take Over Universal Camera Company

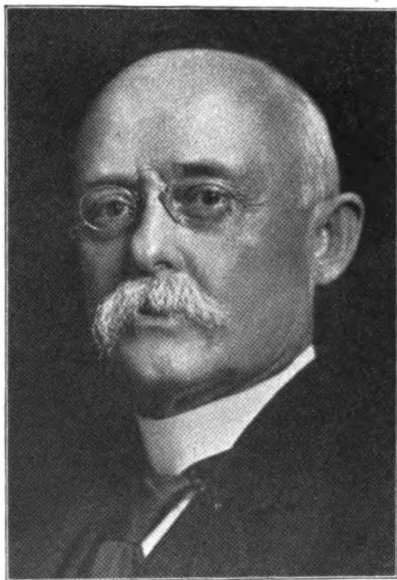
MESSRS. BURKE & JAMES, Inc., of Chicago, have taken over the exclusive wholesale selling agency for the products of the Universal Camera Company of that city, including cameras, tripods, dissolve, etc. Among the users of this camera are many of the most prominent motion-picture men in the world, and also many large institutions, such as the

Selig-Tribune Weekly and the *Herald Weekly*. The camera is also being extensively used in Europe. One of the great advantages of this camera is that it is so quickly set up and operated that the man equipped with it "gets the picture and gets away before the other fellow gets set up."

This is an excellent proposition for photo-supply and motion-picture supply dealers.

Death of Willis G. C. Kimball

THE late W. G. C. Kimball, of Concord, N. H., was born at Manchester, June 4, 1843. The family soon moved to Franklin, where his boyhood was passed attending the district schools and Franklin Academy. Coming to Concord, where he has since resided, in the autumn of 1854, he entered at that time the Kimball Studio as an employee. In 1867 he succeeded to the business, which he had carried on very successfully since, and the Kimball Studio has had a country-wide reputation. His son, Richard H. Kimball, became a member of the firm May 1, 1908, and continued until his death, October 27, 1909.



THE LATE W. G. C. KIMBALL
COURTESY "CONCORD EVENING MONITOR"

W. G. C. Kimball married Ella Gove, daughter of the late Nathan W. Gove, May 31, 1863, and their four children were born in Concord.

Mr. Kimball served in the Eighteenth New Hampshire Regiment in the Civil War, enlisting as a private, being promoted to sergeant-major and captain, and receiving a lieutenant-colonel's commission just before the muster-out of the regiment, July 29, 1865.

He was a member of E. E. Sturtevant Post, G. A. R., of Granite State Council, Royal

Arcanum, and the Wonoclanct Club. He had been on the city park commission since Mayor Clapp's administration, taking a special interest in the development of Rollins Park.

He was widely known in his profession and held in high esteem.

Death of George W. Woodward

GEORGE W. WOODWARD, secretary and director of Sprague-Hathaway Company, Somerville, Mass., passed away at his home, 79 College Avenue, December 18, 1916, of heart failure. Mr. Woodward was universally respected for his high sense of honor and noble character. He will be greatly missed.

"Advertising by Motion Pictures"

BY ERNEST A. DENCH

Cloth, 12mo. Price, prepaid, \$1.50.

THE motion picture has achieved widespread fame as a form of entertainment and it is now likely to repeat this performance in the advertising field. It is an entirely new publicity medium which is destined to become very popular and very effective.

The subject is one on which there is scarcely any information available, so this work by Mr. Dench is the first in the field. This new method of advertising is almost certain to come into general use. The author, who is recognized as one of the foremost motion-picture authorities, has covered every phase of his subject in a thoroughly practical and understandable way. The business man who is seeking up-to-date methods, whether he be manufacturer, wholesaler or retailer, will welcome this suggestive handbook on what is probably the most original and effective way of advertising yet devised. Supplied through this office.

Prospects

WE, in the photographic trade, have been accustomed to let things drop after the holidays, and, expecting little, we have received little. Let us vary the usual order of things and expect something this year, and, furthermore, let us be consistent and act as if we had a perfect right to expect it by going after it with confidence. We need some business to make up for higher costs, both in living and supplies. Other lines of trade are active, and merchants and manufacturers are pumped full of confidence and pep, and there is no better foundation for good business than these two virtues.

Portraiture is the mainstay, and will continue to be so, and it is a good line to follow just as far and as long as the public has money. The commercial line is the great undeveloped field that is rich in possibilities while business is active. The prospects for the winter period after the holidays is for an active business with a free flow of money, and from this outlook there is no other logical conclusion than that opportunities will abound for liberal orders for both portrait and commercial photographs.—*Trade News*.



THE WORKROOM

By the Head Operator

WHAT THE OPERATOR NEEDS
 MODIFIED HYDROQUINONE DEVELOPER
 THE COMBINED TONING AND FIXING BATH
 NOTE ON WASHING BROMIDE ENLARGEMENTS
 CHEMICAL METHOD OF BLACKENING WOOD
 SIMPLE LAMP FOR BROMIDE WORK
 TO RENOVATE CELLULOID PHOTOGRAPHIC UTENSILS
 THE CHOICE OF A PLATE
 NON-BROMIDE BLEACH FOR SULPHIDE TONING
 LANTERN SLIDES
 SOLVING AN OLD WINTER PROBLEM
 LABORATORY NOTES
 PYRO-STAINED FINGERS

DO NOT WASTE DEVELOPER
 PORTRAITS OF MEN
 CLOTHES AND POSE
 STILL-LIFE WORK
 REFLECTIONS
 A SIMPLE PROCESS FOR MAKING SEPIA PAPER WITH
 THE SALTS OF IRON
 PORTRAITS AT HOME
 BLUE PRINTS
 BETTER BROMIDES BY REDEVELOPMENT
 RANDOM NOTES
 MASKING LANTERN SLIDES
 MAGNIFIERS

What the Operator Needs

CONFIDENCE in his ability, and patience, are the two things needed by an operator. The man who is perfectly calm in the operating-room and who nothing in the world can disturb, who never fidgets, never shows any impatience, is the man who is absolutely sure of getting results.

Operating is no easy task. You must put up with the ways and the ideas of your customers, and no two customers can be handled in the same way. No two children can be photographed in just the same way. What will please one child will not please another. You know there are other sittings waiting. These other sittings are worth more money to the studio than the one which you are trying to make. You will get better results, your customer will be better satisfied if you never show any indications of your desire to get through with them at the earliest possible moment.

Too many operators have never had experience of working with other operators and must learn as they go along.

No man ever made a success of anything unless he made some failures, for the man who never made a failure would not have ambition enough to succeed in anything.

Learn to know your camera as an expert engineer knows the engine. He knows just how far to move the lever to start or stop the train within a certain number of feet. You should understand your camera and lens in the same way. You should know just where to place it to get the right lighting and size of head desired.

Do not let your work worry you. Nothing in the world will disturb the sitter and destroy that look which you want to get upon the face as the appearance of a man who looks as if he were worried.

In dealing with groups comprised of all ages you will usually find one among them who knows more about the business than you or any one

else, one who is ever willing to make suggestions to you, and always waiting for an opportunity to find fault with what you have done. Then again you will have in your operating-room persons who come in with the sitter simply to stand around and watch you. Pay no attention to them. Do not even let yourself know that they are there, and do not let them worry you as they do many others.

It is the calm, persevering and cool person who, when the day or week is ended, has accomplished the greatest amount of work.—*Ohio Photo News.*

Modified Hydroquinone Developer

THE particular defect photographers claim against the use of hydroquinone as a developing agent seems to be that of the rather harsh images it produces. This defect is attributed to the association of the hydroquinone with carbonate of soda and sodium sulphite. The great advance in the price of the reagents manufactured exclusively in Germany has led to many substitutes. Fortunately, hydroquinone may still be had at a reasonable price, and if it can be made to give the softer negatives so much needed for exploitation of the artistic phase of modern photography, it may be advantageously used and is an economic factor in the work.

It is quite possible to remedy the objection urged against hydroquinone, and to enable it to produce negatives having the quality of those developed by metol or the other soft-working reagents. The following method permits us to attain this purpose:

Water	32 oz.
Sodium sulphite (gran.)	1½ oz.
Hydroquinone	150 gr.
Ferrocyanide (yellow prussiate)	
potash	75 gr.
Caustic soda	300 gr.
	(75)

This solution keeps for a long time. If separate solutions are desired the following method is recommended:

A	
Water	32 oz.
Sodium sulphite (gran.)	3 oz.
Yellow prussiate of potash	150 gr.
Hydroquinone	300 gr.

B	
Water	32 oz.
Caustic soda	1½ oz.

Keep the two solutions separate in well-stoppered bottles. Use equal parts of A and B for normal exposures.

The development is quite rapid, the image appearing in less than a half-minute and rapidly attaining good density. The temperature, however, must not be below 70°, inasmuch as it is a peculiarity of hydroquinone to be sluggish at low temperatures, indeed inert at or near the freezing point of water. After development and before washing immerse in:

Water	32 oz.
Concentrated solution of bisulphite of soda	½ oz.
Sulphuric acid	1 dram

Let the negative remain in this bath for a minute or two, keeping the tray in motion; then fix (without washing) in hypo, usual strength, to which a little bisulphite of soda is added.

By this operation beautiful negatives are secured, comparable to those made with metol. The final washing from the hypo is done in the usual way.—*Bulletin of Photography*.

The Combined Toning and Fixing Bath

Some Practical Notes

THE vogue of printing-out paper, as far as amateurs are concerned at any rate, appears to be steadily declining; but even workers whose aims are chiefly pictorial, and who employ bromide printing or its attendant processes (*e. g.*, bromoil or ozobrome) for their ordinary work, will sometimes find it an advantage to make a trial print or two upon P. O. P., either as proofs or to serve as guide prints when working one or another of the controlled processes.

In such circumstances a "stand-by" bottle of combined toning and fixing solution will give good service in the work of finishing off the prints, whether they are simply rough ones for the purposes suggested or intended to be completed in the usual way for sale or presentation.

For some time past (probably three or four years) I have used a combined bath which was purchased for, I think, five cents, and as I have employed it quite frequently (not only for prints, but also for certain kinds of lantern slides) it can hardly be regarded as expensive. This observation, however, is subject to a trifling qualification, namely, that the contents of the original bottle has been reinforced from time to time, as described later.

It is fairly well known that a bath of this kind improves with keeping and works better

when it has been used three or four times; this is so much so that one is well advised when purchasing or making up a new combined solution to add part of an old used bath to bring the solution to an active state, a condition which was, I believe, called "ripeness" by the old-timers. My method is as follows: When the solution shows signs of slowing up, I add a few crystals of hypo—about a quarter of an ounce, but exact quantity not important—and a "gold toning" tablet. If the bulk of liquid in the bottle, which in my case is ten ounces, requires making up, the desired quantity of water is also added; this preferably should be slightly warm to expedite the dissolving of the hypo. The whole can then be shaken up until hypo and toning element is thoroughly dissolved, when the solution will again be ready for service. If the reinforced bath is required for immediate use, it is better to crush the tablet of toning compound, and dissolve it, with the hypo, in a little warm water, separately, and then add it to the contents of the bottle. Although warm water is here mentioned it should be clearly understood that this is only made use of with the intention of hastening the dissolving of the additional constituents. The bath should not be used at a higher temperature than 65° F.; at the same time the solution must not be worked when very cold, or the results, as far as perfect fixation is concerned, may not be altogether satisfactory.

There are one or two points which should be carefully borne in mind in order to obtain successful results when toning and fixing are done in one operation. The first one is to place the prints to be toned directly into the bath without any preliminary washing; then to rock the dish so as to keep the print, or prints, in motion during the whole time they are in the solution; and also to avoid the mistake of trying to deal with too many prints at once.

The requisite time for toning and fixing is a factor which may puzzle some workers, especially beginners. I generally reckon that the minimum time in which complete fixation can be obtained is fifteen minutes, and if the desired tone is reached before that period has elapsed the print should be rinsed for a few seconds, and transferred to a dish containing a plain hypo solution of the strength usually recommended for P. O. P.—two ounces of hypo to twenty ounces water—until the prints are fully fixed. If the toning is considered to be finished in eight minutes, then I give the balance of seven minutes in the plain hypo, and so on, making the total time for fixing the standard of fifteen minutes, as mentioned.

Most combined baths when they have been in use for a time contain a grayish sediment; this is no detriment, but I have found it to be very essential that this sediment should be entirely removed from the paper before the print is dried. It might be supposed that the final washing, which everybody knows must be *thorough* if it is to be effectual, would remove this sediment. This is not always the case even when the prints are washed vigorously in running water. To obviate this I invariably "sponge" over both the face and back of print with a little wad of cotton wool, keeping the print under water.

It may be suggested that the necessity of a toning and fixing bath does not arise if one of the many excellent self-toning papers is used instead of the older form of P. O. P. Exactly! but it must be remembered that P. O. P., even when the cost of the toning-cum-fixing bath is added, is less expensive than paper of the self-toning variety. A ten-ounce bottle of efficient solution can be bought or made up for less than a quarter, and can be kept up to standard strength by the expenditure of a few cents per annum. This is obviously an economical investment, even if one only needs to use the bath very occasionally. I do not, of course, claim that a single bottle of combined solution will last indefinitely, even if renewed fairly often, but I do know that when my present stock has lost its virtue I shall filter it off and add it to an equal bulk of new solution, so that not a drop will be wasted.—F. H. B. SMITH, in *Amateur Photographer*.

A Note on Washing Bromide Enlargements

WHEN bromide enlargements or large-size bromide or gaslight contact prints are washed in a considerable volume of water—such as a bath half filled—it will be found, even if the water is kept running, that some of the prints will sink to the bottom while others will show a tendency to float on the top of the water. These diametrically opposite characteristics result from the fact that papers of various makes and surfaces differ considerably in both weight and texture. Both extremes need to be guarded against, as neither the “sinkers” which lie in the hypo-laden water at the bottom nor the “floaters” which remain at the top, with their surfaces almost dry, will be thoroughly washed unless special care is exercised in dealing with them. To ensure that they are effectually freed from hypo contamination (which spells ruin to a print if it is to be subsequently toned) the whole of the water should be entirely withdrawn three or four times during the washing process; the prints which go to the bottom should be laid on the surface of the water and allowed to sink gradually, and the prints which persist in keeping to the top should be gently pressed under water from time to time. Also, in addition to the movement occasioned by the inflow and outflow of water, the general bulk of water should be kept in motion by being frequently agitated during this all-important operation of washing. Above all, the outflow of water must be from the bottom of the washing utensil, in order that the hypo (which, being heavier than water, sinks to the bottom) may be drawn off first.—*Amateur Photographer*.

A Chemical Method of Blackening Wood

MANY makers of cameras and photographic accessories are frequently seeking a means of blackening the wooden parts of cameras by chemicals rather than by paint. In order to secure a good dead-black surface, the wood should first be cleaned well with glass paper and all moisture driven off by heat. The solution is:

A		
Potassium bichromate	30 gr.	
Copper chloride	5 gr.	
Warm water	1 oz.	

After the surface of wood has been well cleansed and brushed from dirt, it is sponged over with the solution, and time allowed for soaking in and drying. When the wood is quite dry, the surface is sponged over with the following solution:

B		
Aniline hydrochlorate	80 gr.	
Water	1 oz.	

If the black thus given is not deep or satisfactory, the process should be again repeated.—*Amateur Photographer*.

A Simple Lamp for Bromide Work

FOR bromide work it is quite safe to have plenty of yellow light in the dark-room, and this is far superior to the ruby light used for plates and films, as it is easier to see how far the print or enlargement has progressed in developing. Those workers who do not possess a dark-room lamp fitted with red and yellow screens may make a lamp for their bromide work very simply as follows: A biscuit tin serves well for the body of the lamp, and this should have two or three holes punched in the bottom to admit air. The lid is then taken, and all the centre removed, leaving about an inch all round the edge. To this a piece of yellow fabric is fixed with “seccotine,” or failing this two or three sheets of deep canary-colored paper sold for decorative purposes. The lamp is then complete. To use it, the lamp is laid upon its side, a candle lighted and put in, and the lid of the box put on. The worker need have no fear of the little white light that escapes from the rear of the lamp hurting his bromide paper, provided it does not come directly in contact with it. The above, though simple, will be found exceedingly useful in practical work for the purpose named.—*Amateur Photographer*.

To Renovate Celluloid Photographic Utensils

WHEN the surface of celluloid dishes—washing utensils and other articles made of this material—becomes worn, dirty and scratched, it can be cleaned and restored by polishing with ordinary whitening made into a smooth cream by the addition only of clear cold water; or with a creamy paste made from good putty powder mixed with water. After this process is completed the surface of the celluloid can be finished off by the application of a little dry whitening on a “selvyt” or other suitable soft cloth.

Another excellent method, which is specially recommended for dishes which have become badly stained, is to give the celluloid a thorough scouring with ordinary silver sand and water, follow this with a rinsing in running water, and then subject the surface to a vigorous rubbing with a soft cloth or flannel dipped in an acetic acid solution. Wash again thoroughly, and the treated surface should then be found quite free from dirt and stains. When dry it can be finished off by polishing with dry whitening, as

previously described. The acid solution employed in this method should be a fairly strong one, say one part glacial acetic to from seven to eight parts of water.—*Amateur Photographer*.

The Choice of a Plate

ALTHOUGH even the same grade and make of plate varies in quality from time to time its general characteristics are usually fairly constant, so that a photographer who wishes to select a plate to suit his special methods of working can make a series of experiments with various brands without feeling that his time and labor are likely to be thrown away by subsequent fluctuations in the kind which he finally selects. Although there is a considerable difference in the character of the image produced upon different plates, most photographers do not seem to have any idea of selecting the best for their own use by any method of practical trial, but only change from one brand to another when they imagine the first has in some way deteriorated, and then they do so very likely on the inducement of a traveler who has possibly never made a negative in his life. Too often we are afraid that an extra 2.5 per cent. at settlement will carry the day against a better emulsion. It is sad to have to say it, but the average standard of "quality" in portrait negatives is not a very high one, and, what is still worse, many photographers do not seem to realize it. If they could keep before them some really well-modelled, fully exposed and developed negatives for comparison they could hardly help feeling that something wanted looking to in their own practice. Good negatives mean easy printing, no matter what be the process used. Even bromides and gas-light papers do not call for poor negatives, although they help to get decent results from them, and for this reason have perhaps helped to cause or increase deterioration in quality.

Therefore we counsel the photographer who desires to make his work as good as circumstances will allow, whether he be turning out postcards in a little village or portraying the high and mighty in a great city, to take pause and make a few experiments so that he may find out whether he is doing as well as he might. It is perhaps necessary to point out that the personal element enters largely into the case, and that studio conditions also largely influence results. "One man's meat is another man's poison," and the plate that gives A the results he desires may be altogether unsuitable for B. Developers and systems of development are important factors, but these come into another category: the problem we have now to solve is the adaptation of a plate to existing conditions.

Assuming that the photographer can recognize under- or overexposure and that he is acquainted with the rudimentary principles of development, the course we recommend is to procure three or four boxes of plates of different makes but as nearly as possible of the same (reputed) H and D number, including the plate he has been using, and to fill slides of the studio camera with one of each

sort. Then let him expose upon the same model, with the same lighting, and develop in the same dish. This is the preliminary stage. It will eliminate those which are less sensitive and will show the characteristics of the others. If a negative be a trifle thin, but otherwise good, it indicates longer development; if one is seen to be full of detail but flat, a shorter exposure and longer development are necessary. The next stage is to repeat the exposures, giving modifications in exposure and development which the previous trials indicated. If none comes near the ideal negative, the lighting must be overhauled and the exposure challenged. Many men are blaming their studio, and worrying because they cannot realize on the plate the effects they see on the screen, simply because they cannot believe that their exposures are incorrect. We have watched men exposing plates upon "fancy lightings" which required twice or three times the exposure necessary for ordinary "three-quarter" lighting without giving any increase, and then heard them complain that the lighting is hard. Within reasonable limits any effect of light which can be seen can be reproduced by photography, but there must be a reasonable approach to correct exposure to do so, and to this end we suggest the use of an exposure meter, not in the orthodox way, but simply as a guide to relative exposures. Let an assistant wear the meter as a locket in the ordinary lighting, and let the time to "tint" be noted; then let her sit as a "fancy lighted study," and note the increase necessary in exposure. The old advice, "Expose for the shadows and let the high lights look after themselves" may be open to criticism for landscape work, but in portraiture it holds good. More portraits are spoiled by under-exposure than by any other cause, and if full exposure were given half the retoucher's work would be saved. To those who like strong effects in lighting we would say: Light your model as now, give the plate your normal exposure, one twice and one four times normal, develop together, and then select the best negative. It may be the normal exposure; in that case you have nothing to learn. It must always be remembered that rapid plates require longer development than slower ones, which take density much more readily.—*British Journal of Photography*.

Non-bromide Bleach for Sulphide Toning

THE question of chemicals seems to be growing less acute, except as regards prices. Monomet is proving itself quite as good, if not better, than metol, but the scarcity of potash salts, or, perhaps, the price, is still serious. Sodium carbonate may very well be substituted for potassium without any very great disadvantage; in some cases it seems to work better, and it is probably better for the fingers than potassium. The bromide salts are still a terrible price, partly no doubt due to the great demand for them from the hospitals for use as a sedative. The last quotation I had was \$9.00 per pound, an absolutely prohibitive price for toning bromide prints in any quantity, so that some

substitute had to be found. And in this matter I do not think the paper and plate-makers have given us all the help we are entitled to expect from them, for they still go on giving formulæ containing metol, when they know quite well that the average photographer cannot get it, and they still continue to give formulæ for toning containing bromide salts.

In the early days of the war I began to look out for some other bleaching agents than the bromides by trying many of those given in the *British Journal Almanac*. After many trials of various formulæ I finally settled down to a chloride bleacher (I had very little success with permanganate), and have used it now for over a year with complete success. Among its numerous virtues it avoids blue metal spots, which frequently spoiled prints when potassium ferricyanide was used. A gallon of concentrated bleaching solution can be made for less than seventy-five cents. It is as below:

Potassium bichromate	3 oz.
Strong sulphuric acid	10 oz.
Common salt	16 oz.
Water	1 gal.

This may be kept in a stoneware jar, and can be diluted to about one-half its strength at the time of using. The solution acts in rather an erratic way; sometimes the prints will bleach quite evenly and completely, at other times in a very patchy way, but this does not seem to affect the final result. After bleaching, a thorough washing is necessary, followed by a bath of salt and water to remove the yellow stain of the bichromate, and the prints must remain in it until the high lights are quite free from yellow, and must be washed again before sulphiding. The solubility of the yellow stain seems to vary with the brand of paper; some kinds need at least ten minutes in the salt bath before it disappears; in other cases the yellow stains may be removed by washing in plain water, but I find it best to give all prints the salt-water bath before sulphiding. In making up the salt bath it is necessary that the salt should all be dissolved before any prints are put into it, because if any granules of undissolved salt are allowed to remain on the face of a print they will cause light marks; evidently the stronger solution surrounding the granules has the power of dissolving the silver chloride image. Some months ago the *British Journal of Photography* suggested a second fixing bath after development as a cure for yellow whites in toned prints. I at once adopted the suggestion, and have followed the practice ever since, and I find that if the second fixing bath is, by some chance, omitted, yellow high lights are sure to follow.

I find it best to use the bleaching solution once only, and then throw it away, and it is cheap enough to warrant this, and especially as there seems to be a loss of brilliance in prints that have been bleached in a solution that has been used before. I cannot explain why this should be so, but there is no doubt in my mind that it is a fact. When first poured out the solution should be a deep bright orange color; with use it darkens to a deep, dull orange

color; it seems to have a tinge of black in it. Such a bath will give flat prints, without any apparent loss of detail in the picture, but the vigor and brightness disappear.

The color of the finished print is exactly the same as that produced by the bromide ferricyanide bath; at first I doubted this, but a print was cut in two, one-half toned with bromide, the other with chloride; the two halves, when mounted together, were of exactly the same color. I kept the print for some months, and quite forgot which was which, as it was quite impossible to tell which was done with chloride or with bromide.

As a safeguard against blisters, I have adopted the plan of using a small amount of alum solution in the sulphiding bath; it will make the solution slightly cloudy, but seems to have no bad effect, and it certainly does have the effect of reducing the number of prints spoiled by blisters. I stated that the chloride bleacher does not produce blue stains, but sometimes dark indigo spots will appear in the sulphide bath; however, they always disappear in drying.—HAROLD BAKER, in *British Journal of Photography*.

Lantern Slides

Lantern Slides Direct in the Camera

DOUGLAS CARNEGIE has simplified the method of making diagram slides direct in the camera by reversal by exposing through the glass of the lantern plate, the focusing screen of the camera being likewise reversed. On account of small differences which may exist between the thickness of the lantern plate and the focusing screen, the lens is used stopped down to *f*/11. The developer is:

A		
Metol	24 gr.	1.8 gm.
Hydroquinone	90 gr.	6.8 gm.
Sodium sulphate	2 oz.	65.0 gm.
Potassium bromide	40 gr.	3.0 gm.
Water	30 oz.	1000.0 c.c.

B		
Sodium carbonate (cryst.)	2 oz.	65.0 gm.
Water	30 oz.	1000.0 c.c.

For use, equal parts are taken of A and B. In very warm weather it is advisable to increase the amount of bromide. This developer is very well suited to intermittent work, as it has excellent keeping qualities.

The exposed plate is placed, film up, in the developer, covered, and left for five minutes. At the end of development the image should be clearly visible on the film surface. The plate is now well rinsed in the dish for one minute, and then flooded with the reversing solution, by which the silver image is dissolved. When rinsing the plate should always be temporarily removed from the dish, and the dish itself rinsed out. Otherwise solution is persistently retained by the capillary space between the plate and the dish bottom.

In place of potassium bichromate as the reverser ammonium bichromate is used, this for-

mula avoiding the slight opalescence of the film caused by the potassium salt. The reverser is:

Ammonium bichromate . . .	300 gr.	17 gm.
Nitric acid (concentrated) . .	3 fl. dr.	93 c.c.
Water	40 oz.	1000 c.c.

Two or three minutes' immersion of the plate in this solution will wipe out the densest silver image. The plate, having been well swilled again for one minute after removal from the bichromate bath, is ready for re-exposure and redevelopment.

Since during the re-exposure the plate must be exposed in the developer *glass side up*, provision must be made that the film itself does not come into contact with the bottom of the developing dish. This is secured by sticking (by means of coaguline) narrow strips of glass on the bottom of the tray (preferably a black one) at either end, so as to act as small shelves for the plate. The previously used developer is poured into the dish; one end of the plate, itself held in a slanting position, is immersed and then the other end of the plate gradually lowered till it is completely immersed. This method of inserting the plate must be followed, for air bubbles in contact with the film would be fatal. If the plate is first placed in position on the shelves in the dish and the developer then poured in bubbles are a moral certainty. The plate is rocked in the developer for half a minute, the dish placed on the floor, and $\frac{3}{4}$ of an inch of magnesium ribbon is burned at a vertical distance of 3 feet above it. The plate is then left covered for five minutes, when secondary development will be complete. Fix in an acid fixing bath and wash.

When soft results are required (as, for instance, in making a slide from a photograph with a delicate range of tone gradation), magnesium light should not be used for the reversal exposure. In such cases the weaker light of a No. 4 flat-flame gas burner is to be preferred. The light from a gas pedestal, about a foot high and standing on the table, may be conveniently reflected by means of a mirror on to the plate as it lies glass side up in the developing dish. The mirror is clamped at an angle of 45 degrees to the vertical a foot above the dish, and the gas flame is placed some 18 inches from the mirror. The light is kept on during the whole time of development, the duration of development being now regulated by inspection of the plate and the character of the slide required.

Even if there be no appreciable fog, short immersion in a reducing bath always enlivens and brightens up a diagram slide. The best method of procedure is as follows: Place the plate for a minute or so in water to which enough potassium ferricyanide has been added to color it distinctly yellow. Wash, and then immerse in a *very* weak hypo bath. If there has been fog or veiling of the background, and it is not yet removed, repeat the process. Do not expect the veiling to disappear in the ferricyanide solution. This plan of applying the Howard-Farmer reducer in stages removes fog or veiling without detracting from the

pluckiness of the image, as the employment of the mixed reducer is very apt to do.—*British Journal of Photography*.

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Lantern Slides Direct by Reversal

H. d'Arcy Power has perfected the exact working of the method of producing lantern slides (or enlarged negatives) direct by reversal advocated by the late Douglas Carnegie and by M. Balagny. He has found that success with the method depends upon giving attention to the following points: (1) The length or strength of the first exposure. (2) The depth of the first development. (3) The second exposure. (4) The nature of the reversing bath. (5) The clearing bath.

The first two factors are best considered together. It must be remembered that the first or negative image is to be removed, after which the residual silver will form the permanent positive image. If the first image is too dense, it will leave, on removal, too little emulsion wherewith to form the second, and the resulting positive will be too thin. If, on the other hand, the first image is too thin, the final positive will be dense and dull. This is the problem of the autochrome development. In lantern slides, such as Lumière's and Seed's, the correct development is that which shall give a full detailed picture on the emulsion side (being exposed through the glass, the image builds from the glass upward). There must be equally correct exposure. If the exposure is too short, the final result will be hard; if too long, matters will be still worse, for, though we cease developing when the image has attained a certain density, there will remain over a residuum of undeveloped, but light-affected, silver bromide, which will not be removed by the reversing bath; and, on the second development, it will appear and cause fogginess and a mixed image. Theory and practice alike demand that the exposure shall be so timed that the development shall tend to stop at the attainment of full density. Of the two evils, it had better be under-exposed than over.

As regard the second exposure, we have a plate covered, for the most part, with unchanged emulsion, but being a negative image next the glass, and we expose it to light through the glass. Where the heavy deposit, made by the high lights, lies, the light penetrates with difficulty; yet in time it will penetrate and so affect any unchanged emulsion then present, which, on redevelopment, will fog the image. This is what always happened before Balagny suggested using the negative deposit as a screen. If we under-expose, the detail in the high lights will be lost, and the resulting image will be weak. In practice, with a well-graded and fully developed negative image, about three minutes in bright, diffused light will give a good deposit in the half tones and not fog the high lights. Artificial light has not been found satisfactory. In regard to the reversing bath, the acid bichromate is better than an acid permanganate bath, but the bath should not be used more than twice in succession. It is very inexpensive and easily mixed, and repeated

use of the bath leads to yellow staining of the gelatin. The redevelopment may be done with the portion of developer used for the first development; but on no account again use a developer that has been on a reversed plate, or strong staining of the gelatin will ensue. It required not a little experimentation to confirm these facts.

Working details are as follows: (1) Expose *glass side outward*, so that full development may be obtained without fogging. (2) Develop for greater density than usual in a negative. (3) Wash for from three to five minutes. (4) Turn film side down in a pan of water, with a piece of black paper next the film, and remove into full daylight for from three to five minutes. (5) Return to dark-room, remove plate, face up, to a bath of 0.5 per cent. ammonium bichromate, acidulated with 1 per cent. nitric acid. In three minutes the image will have disappeared. (6) Wash, in dark-room, for fifteen minutes. (7) Redevelop to rather more than required density. (8) Fix in hypo. (9) Should, as is often the case, the surface be soiled by a slight deposit, one much like that on the surface of glossy developing papers, wash over with a little weak Farmer's reducer, and it readily disappears. (10) Wash. The resulting slide should be identical in gradation with its subject. It can be reduced, intensified, or toned like any other lantern slide.—*Cam. Craft.*

Uranium Intensifier in Making Lantern Slides Direct

W. L. G. Bennett, for making lantern slides, prints, half-tone or line, direct in the camera without preparing a negative, has worked out the following process:

Develop in the usual way and, without fixing, tone with uranium.

Expose to light, so as to print through the uranium image a positive one on the remainder of the sensitive film beneath.

Develop this new image, at the same time removing the old one.

Lantern plates should be of the rapid brand. A suitable developer is:

Sodium sulphite	360 gr.
Diamidophenol	15 gr.
Potassium bromide	3 gr.
Water	5 oz.

It will not keep good for more than about four days.

The ordinary uranium toning bath may be used. The following has been found a good formula:

A	
Uranium nitrate	40 gr.
Glacial acetic acid	$\frac{1}{2}$ oz.
Water	10 oz.
B	
Potassium ferricyanide	40 gr.
Glacial acetic acid	$\frac{1}{2}$ oz.
Water	10 oz.

Mix equal parts at time of use.

Develop in the first instance until detail is visible in all parts, but not for so long as if

the plate was going to be at once fixed and finished.

Rinse in two or three changes of water for about two minutes, and then apply the uranium toner. As soon as this has been poured over, lift out the plate and, holding it up to the red light, carefully note the density of the darkest parts, immediately returning to the bath. On again examining it in two or three minutes the dark parts will appear much lighter, as the red uranium deposit looks light in the red illumination. With a little practice it is easy to judge when the original silver deposit has been completely acted upon by the uranium. Thorough toning is absolutely necessary, but with fresh solution the action is certain to be complete in five minutes or less, and it is not always necessary to examine the plate.

After complete toning, again wash the plate for two minutes or more in three or four changes of water. Now lean the plate against a piece of black or dark red paper and burn 2 inches of magnesium ribbon at 4 or 5 inches' distance.

Now return the plate to the original developer. Judging the time of this development is the most difficult part of the process. If insufficient, the half tones will be fully out, but the shadows far too weak. If overdone, the slide may be foggy, but this is of less importance, as the fog may be cleared away by subsequent reduction.

It should be continued until the positive image looks strong and full of detail when held up to a fairly bright red light, and the whole surface looks black by reflected light, the high lights being still blocked up by the negative uranium deposit. At least, this is the case with diamidophenol, but with rodinal the uranium may dissolve away at once, in which case development may be judged as when making a slide in the ordinary way.

Fixing is carried out as usual. White light should not be admitted until this is nearly completed.

When taken out into the light the high lights will very likely be found to be red or yellow, owing to the uranium. Immersion in a solution of washing soda of any strength will instantly remove this.

If the subject was one with average contrasts, and the first and second exposures and other details reasonably correct, the resulting slide should be clear and bright, and need no further alteration. Otherwise a certain amount of veiling of the high lights may be present.

Solving an Old Winter Problem

NEARLY every winter a number of professionals complain of lack of body in their negatives. They blame the plates or the developer—but the whole trouble, in nine cases out of ten, is that they have not got into the regular swing of their winter work.

As the days draw in, there is a general yellowing of the light. If the operator goes on giving summer exposures, after the light has lost so much of its actinic power, his negatives are certain to be under-exposed. The obvious remedy is to give longer exposures.

Even when the exposures are correct, there is too often under-development. If the professional does nothing to raise the temperature of his developing solutions in the winter, what can he expect but under-developed negatives? Every developing solution loses its power rapidly as its temperature falls, and a very cold developer can scarcely be called a developer at all. The temperature should never be below 65°—and the photographer who warms his solution up to this point and *keeps it there* will have no reason to complain of weak negatives.

Good, strong, plucky negatives, with plenty of gradation and body in them, can be secured in winter as well as in summer by increased exposures and by raising the temperature of the developing solution.—*Professional Photographer.*

Laboratory Notes

Developers

MANY photographers labor under the impression that metol cannot be made in this country. Metol can be made, and is made, but not on a sufficiently large basis or at such a price that it solves the problem by any means. To establish a chemical works that would supply any quantity of metol means the outlay of a good deal of money—the ending of the war would mean competition with the European manufacturer, and the American manufacturer naturally is not taking any chances. We have been informed, however, that one of the largest works in this country expects to be able to supply metol under another name in a few months, so that the supply is not likely to vanish from the market.

Working to find a cheap and satisfactory substitute for metol in the form of some altered developer which was at hand, the possibility of the use of some of the caustic alkalis, instead of the alkaline carbonates, was tried, as being of greater activity. These hydrates—sodium, lithium, and potassium, respectively, have never been used to any great extent—partly on account of the action on the skin, and partly because of a certain softening of the film, as well as a prejudice against strong alkalis. They are generally regarded by the non-chemist as simply stronger carbonates (that is, stronger alkalis than the carbonates), while in their action they bear no resemblance to the carbonates.

Dr. Andresen first discovered their peculiar action, and the well-known developer, rodinal, is the best-known application of the hydroxides to developers. Von Hubl, in *Die Entwicklung der photographischen Bromsilber Gelatinplatte bei zweifelhaft richtiger Exposition*, has given at some length the true explanation of this action in the developer. The hydrogen in the hydroxyl groups of the phenol or naphthol developers can be replaced by potassium, sodium, or lithium, whereas the alkaline carbonates simply make the solution alkaline without changing the nature of the developer. In other words, the hydrates or hydroxides form salt-like compounds which will develop even when nearly neutral, although they work better when they are slightly alkaline, while the carbonates form developers which must be alkaline in order to develop in an ordinary lifetime. These developers from the

caustic alkalis are energetic, do not fog, and can be diluted *ad libitum* without changing anything except time of development; also, they keep splendidly. I have worked out some formulæ which will probably be of interest; one of which, I think, is exceedingly valuable, *i. e.*, the hydrochinon.

But, to begin with, buy your chemicals of a supply house, but get them to get known brands. Eastman is as good as any—possibly a little cheaper for the same grade—and see that your chemicals are C. P.; it is an outrage to have anything else, anyway. When one walks ten miles to get a picture and then has it spoiled by some of the terrible messes that are sold as photographic chemicals—well, we have all done or will do it, and the state of mind is too well understood to make it necessary for me to say anything about it. Get Kodak chemicals and you will not go wrong.

Hydrochinon. Add 1 gram of sodium bisulphite (dry) to 90 c.c. of water (distilled if you can get it). When dissolved add 2 grams hydrochinon. Now add 90 c.c. more of water, dissolve 4 grams anhydrous sodium sulphite and 2 grams potassium hydrate (in sticks purified with alcohol) or 1.5 grams of sodium hydrate (in sticks as above). When dissolved add to the first solution containing the hydrochinon and filter. The water is better hot than cold and better distilled than tap. When it is cold, bottle with rubber stoppers and have the bottles full. It will keep well and is a most satisfactory developer. It may need a little bromide when used with velox or cyko and sometimes does with bromide papers. When used with papers it is best used about 1 part developer to 1 of water. For plates or films it may be diluted as necessary, but bear in mind that the image will appear very quickly and probably will require some little time to build up.

The following formula will be found very good for hydrochinon without metol:

Water	850.0 c.c.
Hydrochinon	6.5 gm.
Sodium sulphite	30.0 gm.
Sodium carbonate	100.0 gm.
Potassium bromide (saturated solution)	20 to 30 drops

The image comes up immediately but time of development should be about one minute.

Pyrocatechin. On the chance that some one may be in touch with a small stock of this excellent developer, I have worked out a formula for it. To 100 c.c. of hot water add 1 gram of sodium bisulphite, and when dissolved add 10 grams of pyrocatechin. In another beaker add 25 grams of sodium sulphite (anhydrous) and 10.5 grams potassium hydrate, to 100 c.c. of water, and when dissolved add to solution containing pyrocatechin. Filter and bottle. This does not keep so well, but is the most energetic developer of all, the entire image appearing as soon as the developer sweeps over the plate or film. This should be used about 1 part to 2 of water for paper; for plates, films, or bromide paper it may be diluted as seen fit. It is probably the best lantern-slide developer known—in spite of the wearying repetition of the well-

known statement *re* hydrochinon. Photographers tell themselves fairy tales like this until they believe them themselves.

Paramidophenol. I will give two formulæ for this—one in line with the others and one which will give rodinal: 100 c.c. of water as hot as the hand will bear, say 80° C.—add 30 grams potassium metabisulphite C. P. When dissolved add 10 grams paramidophenol. Stir well. In 50 c.c. of water dissolve 19 grams of potassium hydrate. Now add the solution of potassium hydrate to the solution of paramidophenol very slowly, with constant stirring. A heavy precipitate will form, and the solution of potassium hydrate must be added until this just dissolves and disappears. Should it be found that the whole of the hydrate is added and there still remains a precipitate very small pieces of potassium hydrate should be added until it dissolves. Should it not be necessary to add the whole of the 50 c.c. of hydrate solution, the completed developer should be brought up to 150 c.c. with water. This can be used about the same as rodinal, although there is a slight difference.

The next formula gives a solution which can be used exactly as rodinal, and it may be substituted for it in any way. It is of the same strength and dilutions for rodinal or temperature tables will serve for the developer about to be given:

Water	1000 c.c.
Paramidophenol	20 gm.
Sodium sulphite (anhydrous)	150 gm.
Lithium hydrate	8 gm.

Dissolve the sodium sulphite in about 800 c.c. of hot water; when dissolved, add the paramidophenol. Dissolve the lithium hydrate in about 100 c.c. of water and add to the first solution with constant stirring. A heavy precipitate will form, and the lithium solution should be added until this precipitate just dissolves. The bulk of the solution should be made up to 1000 c.c. and bottled. To all intents and purposes, this is rodinal.

Should the given amount of lithium hydrate refuse to dissolve the precipitate first formed, do not allow the bulk to go above 1000 c.c., but add tiny pieces of lithium hydrate until solution takes place. Should the precipitate be dissolved when only part of this hydrate solution has been added, do not add the rest, but make up to 1000 c.c. with water.

Pyro. Our old friend pyro if used with an excess of sodium sulphite and a little potassium ferro-cyanide (not ferri) will give excellent prints.

The following formula will be found to give good results and is based on one given by the Ansco Co.

No. 1	
Pyro	12 gm.
Sodium sulphite	80 gm.
Potassium ferrocyanide (not ferri)	2 gm.
Water	500 c.c.

No. 2	
Sodium hydrate	4 gm.
Water	500 c.c.

Use one part No. 1 and one part No. 2 with water 2 parts, and 3 drops of saturated solution of potassium bromide to every 400 c.c. of developer. The potassium ferrocyanide takes up all the oxidation products and reduces staining to a minimum. The color is very good and the developer may be used repeatedly without materially reducing its speed, which is about one to one-and-a-quarter minutes. This also gives very good prints for sepia toning. If diluted to half strength it gives softer results without changing the gradation too much.

Ferrous Oxalate. Ferrous oxalate also makes a good developer for any paper and a formula may be welcome.

No. 1	
Ferrous sulphate	250 gm.
Sulphuric acid	3 c.c.
Warm water	1000 c.c.

Dissolve the salt in the water and add the acid slowly.

No. 2	
Potassium oxalate (neutral C. P.)	250 gm.
Potassium bromide	1 gm.
Warm water to make	1000 c.c.

Add 1 part of No. 1 to 4 parts of No. 2, *not* vice versa. After development and without washing rinse well in acetic acid; stop bath before placing in hypo. Should this give greenish tones, decrease the amount of bromide. This has long been the great standby for bromide papers in England, next to amidol, and is a very good developer. Should there be a yellow stain the following will probably remove it.

Alum (saturated solution)	1000 c.c.
Hydrochloric acid	40 c.c.

Wash well after this bath.

Putting Sky or Figures in Landscapes

Putting Skies in Landscapes. Some new ideas in enlargements have been worked out in the last year, and it is possible that the readers of the *Annual* may be interested in the reading of a simple direct method of putting in skies or figures in landscapes. The accepted method, according to the "books," has been to make an exposure for the landscape, then an exposure for the sky, and then develop them together. Most of us have tried that. We put a negative in the lantern, threw it up on a piece of bromide paper, then drew a light pencil-line where the skyline came, made our exposure, then put our cloud negative in the lantern and tried to fit those clouds to the skyline. Then the exposure was made for the clouds and the print was slid into the developer. Then one of two things happened: Either the sky came sailing up as black as ink with an anemic-looking foreground, or else the foreground came briskly into view leaving a sky which was a weak disappointment or else white paper. Oh, yes, the exposure was tested; but in these days of high prices it finally dawned upon me that to make a dozen enlargements and put a sky in each, from twelve different negatives each week, would require just thirteen weeks

to ensure my name appearing in the petitions in bankruptcy. Hence, the following method:

Make your enlargement of your landscape negative, giving such exposure that it will develop to the point where it is as dark as desired. If your exposure is right it will go to that point and stop. If your exposure is in excess, the print when left in the developer until it stops will be too dark. If the exposure is insufficient, the bromide will be too light no matter how long it is developed—and here let me say, that a bromide print or a gaslight print will not develop more than the exposure has determined.

Do not be afraid to leave your prints in long enough. Insufficient development, caused by the effort to save an over-timed print, never gives as good a print as one which has had the exposure so timed that, when the print has developed as much as it will go, it is just dark enough. Herein lies the cause of poor sepias, in almost every case. When your prints are done developing they will stop—dead. If they are not dark enough, give more exposure. If they are too dark—less.

We make, then, an exposure of our landscape negative so that it will develop until it is dark enough and then stop. Now place it for a minute or so in a weak acetic acid stop bath, and then wash for three or four minutes in the dark. In the meantime, while it is washing, put your cloud negative in the lantern, put an orange cap on the lens, and after your enlargement has been wiped off with a clean piece of cheesecloth, pin it up on the easel. Now adjust your clouds in the sky and give 50 per cent. more exposure than you would on dry bromide, as the washing and rinsing will slow your paper about that much. Take your paper from the easel, and place back in the developer, and develop your sky until it suits you; rinse in a stop bath and fix.

The explanation of all this is, usually the sky in a landscape negative is so black that it will print as white paper in an enlargement. If it does not, help it out a little with Bildup and graphite, or some opaque on the glass side of the negative, or with shading. The landscape is developed as far as it will go, and then the developer neutralized and washed out to a great extent. The sky, being dense in the negative, does not print and consequently does not develop with the foreground. The cloud negative can only print where there is unchanged emulsion, *i. e.*, the sky, and as a matter of course will print wherever the sky is blank, but will not print across treetops, houses, hills, etc. The depth of tone of the sky is under perfect control—in fact it is better to overexpose rather than under, as it is under control. If the print is to be sepia, the sky must be developed as far as it will go, but this is usually easy to do. Sounds complicated, but just try it.

Placing Figures in Landscapes or Interiors. Suppose that we have a landscape which could be considerably improved by the insertion of a figure. Determine the size of enlargement desired by making one of that size. Now, with a pair of compasses, measure from objects in the enlargement the height of figure necessary and photograph your desired figure in that size. Make contact print of this figure-negative, preferably

on glossy paper so that it can be ferrotyped. Cut out the figure with a sharp pair of scissors, saving the part from which it was cut. Take your landscape or interior, place it in the lantern, and (with orange cap or lens) tack your cut-out figure on the surface of the bromide paper with a dab of library paste. This will leave (when the exposure is made for the landscape) a masked spot undeveloped, and after the first exposure has been made and developed, we have the landscape, or what not, with the space occupied by the figure, unexposed and undeveloped. Now remove the little cut-out figure (it may remove itself in the developer), and sponge the face of the print to remove all traces of paste, rinse in acetic acid stop bath, and wash for two or three minutes. The piece of paper from which this figure was cut, which we saved, is pasted on the back of the negative of the figure to form a mask. After our enlargement has been well washed in the dark, we dab it off with cheesecloth and put it up on the easel. Our negative of the figure with its paper mask on the back goes in the lantern and we make an exposure, being careful to give about 50 per cent. more than with dry paper. This is then developed, and it will be found that it is very little trouble to fit the figure so closely this way that a very little spotting will take care of all edges. It is possible to put a figure from any size negative in any size enlargement, by similar means, which will be perfectly apparent after making one by this method.

Putting Clouds in Lantern Slides

Again—clouds in lantern slides. I do not say that it is not possible to put clouds in lantern slides by double printing, any more than this is true of bromide paper. It has been done by patient men who are willing to spend hours of time and dozens of sheets of paper or box after box of slides—I say it has been done. Personally I never knew anyone that could do it, had done it, or had ever seen a slide made this way, and my personal belief is that the only slide that was made this way was one of a white crow.

Cloud negatives can be had in many varieties, on film. The best ones I know of are sold by Butcher & Sons, of London. They may be had in all sizes, at a very small price, can be used either way around, and for the method I give here are the only ones that will do. Any dealer can get them. They are made on a very thin film stock, are quite contrasty, and come in a large assortment.

Clouds are easiest to put in a lantern slide with a cloud negative of lantern slide size or quarter plate at most. After your lantern slide is made, fixed, washed, and dried, adjust your cloud negative on it so that the sky is to your taste, place a lantern slide plate on top of the cloud negative, and expose, being careful not to get the clouds too dark. The slide of the landscape acts as a mask, and when this slide we have just made is finished it will be found that the clouds *fit* the horizon, no matter how the trees, buildings, etc., project into it, because the landscape slide was used as a mask and took care of all irregularities in the skyline. It works—I am using it daily—when I make lantern slides.

Lantern Slides in Color

Lantern slides in color have been a favorite form of photography with me for years, and with the disappearance of supplies for the Paget plate, due to war conditions, the autochrome has come into a little more prominence. There has been more twaddle written about these plates than any other one brand. Every user had a pet method of his own, and the majority of those who talked to conventions and associations fell back on the "maker's formula used as directions gives the best results, and you will find their little instruction sheet gives all that can be learned, except by experience." They used to say that, "He who is self-taught has a fool for a teacher," and I often wonder whether this experience business is not the same. Practice—yes, but not experience. The autochrome has a plate speed—as do all plates. It also has a development speed in common with all other plates. Given these two factors, it has been possible to work out a method for autochromes that will do more than the experience method in one way at least—it always works.

First, exposure. Watkins makes a special color-plate meter, which takes into consideration the alteration in speed of the autochrome in different strengths of light. Any plate which is sensitive to the whole of the visible spectrum—or to the greater part of it, such as the color plates, the Wratten Panchromatic, and others—does not have the same speed in weak light that it does in strong. The stronger the light—other things being equal—the faster the plate. This is not a constant but varies on a law of its own which is embodied in the color plate meter. If we take the autochrome as No. 2 on the Watkins color meter outdoors, on No. 1 indoors, it will be very close. This is for a slide intended for the lantern, and I project my slides to a brilliant six or eight foot disk with a six ampère parallel arc lamp. If intended for hand viewing they may be a little denser. Dark objects naturally take more exposure; but if you use the Watkins meter you will find that the meter is built for objects of about the nature of an open landscape, and that there are factors given for (1) dark objects, old buildings, etc.; (2) sky and sea, distant view, etc., and if these are used with any judgment at all failure through exposure is impossible. I wish I could say as much for all the systems of estimating exposure. The unwary amateur can go into a supply-house and buy things which are enough to make a thoughtful man miserable for days when he thinks of what will happen when the amateur and the catchpenny trinket go out with a kodak.

Development of the autochrome is usually a matter of a table which you look at in the dark, and try to find where your graduate of developer is at the same time. Honorable men say that they have done this and got results by this method, and I must believe them, else where do we find ourselves with our confidence in the veracity of the human race undermined? There are two ways by which we can develop with certainty: Using the special Wratten safe-light for panchromatic plates, and the Watkins thermo pyro developer, with a dilution of 1

part A, and 1 part B, 6 parts of water, we have a factor of 5. Now, it is possible to see the image, leaving out the skylines, as soon as it appears if one will only wait a little after entering the dark-room. Owing to what is known as the Purkinje phenomenon, the green light of the safe light, while not strong enough to fog the panchromatic emulsion, is more easily perceived by the eye than a red one of equal strength—i. e., the green light is safe because it is so weak—but the eye can see with it. A red one which was weak enough to be safe could only be seen by the eye with some difficulty.

Taking, then, some prominent part of the image as a guide, we develop factorially, giving five times the appearance time. The plate is then reversed in the bichromate reverser, exposed to strong light, washed about thirty seconds, and dried. After drying, it is re-developed in the same developer that was used for first development, as far as it will go, washed for about sixty seconds in running water and dried.

The bichromate reverser tends to toughen the film and is much more convenient to use than permanganate, as it has always been a pet theory of the writer's that 1 gram of potassium permanganate, properly used, would dye the universe a rich pink, from his experiences in getting it out of sinks, etc. The object of allowing the plates to dry after reversal is to toughen them so that there will be no danger of frilling. Should there be any trouble from this source, rinse the plates after reversal in the bichromate solution, and then place for two minutes in a solution of chrome-alum (which should be in dark purple crystals, without any gray powder on the surface—and will be if it is good) of a strength of 1 per cent.—10 grams to the litre. Rinse, allow to dry, and re-develop, and frilling will vanish.

Now after your plate is done. If it is over-exposed it will be thin and weak. If it is under-exposed, it will be dense and have no detail. If you have plenty of detail and yet the slide is too dense, use a larger factor next time. If you have plenty of detail and the slide is all right but is too thin, use a smaller factor next time. Density of slides is like the length of a piece of string—two men look at the same slide and one says, "Thin," and the other says, "Dense." Put it in the lantern or in the diascopie—and you will soon know. Autochromes can be made as thin as a Paget if desired—full exposure and a factor a point or so larger.

The advantage of using the factor is that after your first slide it is easy to determine just how long to develop. With the other methods there is enough variation in the speed of the plates in development to throw one clear off the track.

The other variation that is possible is development, is to use a 5 per cent. solution of potassium metabisulphite for about four minutes in complete darkness before first development. The plate is immersed in this solution for about four minutes in the dark, and then washed for a couple of minutes—also in the dark—and may then be developed by the ordinary ruby light. This method works excellently, although it is apt to vary the factor considerably, and not

always to the same extent, as a varying amount of the acid salt is always carried over into the developer. Altogether, I would advise the use of the special Wratten safelight for panchromatic plates, and straight factorial development. If a little care is used in varying the development factor, or if necessary the plate speed of the autochrome, it will be found easy to make these plates as transparent as may be desired. Give exposure enough so that there is plenty of detail, and develop with the factor given until you see what the first plate comes to and then change your development speed by making the factor larger if your finished plate is too dense, or smaller if it is too thin. But after you have determined the kind of autochrome you want, you will find that using a plate speed of Watkins 2 and the factor (normal or otherwise) given will give you as good autochromes as can be made.

One must point about autochromes and I must close. If for any reason you find blue fog all over your slide—your camera or slide is leaking somewhere. Hunt up the leak and fix it, but to save the slide try this. Fix out a lantern-slide plate and wash it and dry it, and then with Japanese water-colors or Velox water-color stamps color it a light yellow all over. Place this over your autochrome and you will find that a very small amount of yellow in this cover-glass will counteract the blue and your slide will be useable at least. I have a birdseye view of one of the eastern cities, which was a lovely blue cast when completed owing to a leak in my dark slide, at one end. A light yellow cover glass corrected this and it is almost as good as if it had been free from light fog in the beginning.

I find that I have neglected to give the formula for the Watkins thermo pyro so will append it here.

No. 1	
Pyro	74 gm.
Potassium metabisulphite	37 gm.
Sodium sulphite, dry	400 gm.
Water to	2000 c.c.
No. 2	
Sodium carbonate, dry	400 gm.
Potassium bromide	18 gm.
Water to	2000 c.c.

Use one part of each with six parts of water for autochromes. The factor is 5. This is the standard thermo developer and can be used with the dilutions given in *Science and Practice of Photography*, by Alfred Watkins.—MARCUS G. LOVEFACE, in *American Annual of Photography*.

Pyro-stained Fingers

PYRO-STAINED finger-tips are unsightly enough (says *Photography and Focus*), and have been given as a reason against taking up photography at all. There is no excuse for them if a little care is used, first, to keep the fingers out of the developer as much as possible, and then to tackle any stain before it has had time to get deeply into the skin and become indelible.

In a convenient position on my shelves I keep a bottle containing a strong solution of sodium sulphite to which a little acid has been added—citric, hydrochloric, and sulphuric acid are equally suitable, and the quantity is not im-

portant. A dram or two of strong sulphuric acid may be added to half a pint of a 25 per cent. solution of sodium sulphite. The result is an evil-smelling liquid, half an ounce of which, diluted with 4 or 5 ounces of water, may be put into a wide-mouth vessel, such as a measuring glass, which is placed beside the developing dish. If the fingers have to be put into a pyro solution they may be dipped into this mixture afterwards and then rinsed; or the mixture may be used with pumice-stone in place of soap. It works on pyro stains like magic.

Do Not Waste Developer

THE present condition of the chemical market calls for extreme economy in the use of developing solutions in your bromide and gas-light printing.

Are you economizing?

It is not suggested that you should make up your solution with less than the proper quantity of developing agent. This would be the wrong sort of economy. The proportions of the solution would be destroyed and the result would be disastrous. There are, however, methods of economy that will conserve the developer without affecting the resulting print.

It has been proved by comparative tests that a given amount of developer in a 14 x 11 dish will properly develop a certain number of prints. In order to develop the same number of prints in a 17 x 14 dish, approximately one-third more solution is required.

The reason becomes quite plain when it is remembered how rapidly coal-tar developing agents oxidize when exposed to the air. The 14 x 11 dish exposes a surface of 154 square inches of developing solution to the air. The 17 x 14 dish exposes 238 square inches, which is a 54 per cent. greater area of solution for the air to act upon.

To develop the greatest number of prints possible, with a given amount of solution, use a deep dish as nearly the size of the print as is consistent with convenience in handling your work. The saving of developer is worth a great deal more than the slight convenience gained by using large dishes.

Another, and equally great, economy is suggested by the glass rod, over which the silvered paper of former days was drawn to drain the surplus silver solution back into the dish.

By carelessly tossing a 10 x 8 print from the developer into the water, as much as half an ounce of developer may be carried with the print. Try it for yourself. Lift a 10 x 8 print from the water with a quick movement and allow the water to drain into a small glass measure. Then estimate how much solution is wasted in developing a gross of prints, if they are handled in the same manner in carrying them from the developer into the water and fixing bath.

The economies suggested are not altogether a matter of money saving; it is imperative that the small quantities of developing agents available should be made to go as far as possible.—*Professional Photographer*.

Portraits of Men

"So many who begin to study dictate to Nature; if they have a man or woman model before them they impose a preconceived attitude with no relation to the mind or actual intention of the subject. Today, toward the end of my career, I still content myself with leaving my model to himself or herself. I dictate no poses. At most, I venture to prolong them, when I have found what I seek."

These are the words of Rodin, the famous sculptor. They are words to be remembered, especially by the photographer who wishes to make good portraits of his men sitters. If you wonder why Rodin's method is more useful when photographing men than it is when photographing women, look over a batch of photographs that you have taken, and compare the men's portraits with the women's. You will see that in your pictures of men there is more often a strained expression, an uncomfortable look, or an appearance of affectation than there is in your pictures of women. Why is this?

In the first place, it is much more difficult to make a man feel at home in a studio than it is a woman. Have you never noticed that when a man enters the studio he usually begins to stroke his hair, to adjust his collar, or to flick imaginary spots of dust off his coat? He is not exactly shy; he is simply out of his element and, as a consequence, is extremely awkward. When a woman comes into a studio she experiences little more than the sensation which she feels whenever she dresses for a dinner, a theater, or a garden party. She is accustomed to making the most of her appearance; she has a natural inclination to try to look her best at all times.

Then again, a man usually looks upon having his photograph taken as a disagreeable duty—something to be got over as quickly as possible. Going to a studio brings him face to face with a question which has not usually troubled him very much. He is forced to ask himself: "What do I look like?" Up till now, he has been quite content so long as he has had a shave, clean linen and boots, and his clothes well brushed and pressed. The feeling that he is in the presence of a man who cares for nothing but what he looks like, makes him awkward and self-conscious. He squares himself up for the ordeal; he holds his body rigid, and resolutely stares at some mark on the wall. The most the photographer can get in these circumstances is a mere map—a hard, lifeless picture.

"One can do nothing with a man in modern dress; he is so stiff and ungraceful," says the professional. But is this really true? Is there any difficulty about photographing men which cannot be overcome by observation and practice? In making portraits of men, the chief difficulty is to secure variety and naturalness, and to avoid the appearance of strain or affectation. It is admitted that this difficulty is largely due to the severe lines of the modern man's dress and to the self-consciousness of the sitters. Photographers realize the difficulty, and the result is that they easily fall into the habit of attempting nothing but a few stereotyped poses which they have found acceptable. They approach their sitters

with these poses already fixed in their minds; they try, as Rodin says, "to impose a preconceived attitude, with no relation to the mind or actual intention of the subject."

These stereotyped poses, which are well known, are the things most of all to be avoided. Simplicity is the key to success. Life and character are more valuable than grace in men's portraits. If grace can be combined with the more valuable qualities, so much the better; but the chief aim should be to suggest the real qualities of manhood. Examine a collection of portraits by modern painters and some of the best photographers, and you will see that, in their portraits of men, they rarely attempt anything beyond the simplest pose.

What is the secret of the success of Pirie Macdonald, whose portraits of men are known all over the world? It lies in the fact that Macdonald has trained his eye to see men as they really are in ordinary life. He has set aside all the conventional studio formulæ for posing and lighting. He aims at getting into his portraits the very spirit and personality of his sitters.

If you want to get more character into your portraits of men, you must, first of all, cultivate the art of making sitters feel at home. This is not easy. It cannot be picked up by reading a text-book. As a hint, however, it may be said that some photographers make the mistake of not mixing with men away from business—they are not "men's men"; they never give themselves an opportunity for cultivating companionship, and they have never acquired that ease of manner which enables them to conquer their own nervousness in the presence of strangers. Obviously, a sitter cannot feel at home if the photographer himself is nervous and flurried. Advertisements often appear in the photographic press for operators "clever at posing and lighting." It would be difficult, however, to find an advertisement asking for an operator who must be tactful, well-read and well-informed on current events; who must be a good conversationalist, a keen observer of human character and have a pleasant easy manner. Yet these qualities go a long way in the making of a successful operator.

When a man feels at home he unconsciously takes certain poses; he has a habit of holding his head at a particular angle, or, it may be, that there is a peculiarity in the way he disposes of his hands when he is resting or thinking. Or again, you may notice some peculiar way a man tightens or relaxes the muscles of his face, according to whether he is interested, pleased or bored.

These poses and expressions are part of the man. They are the distinguishing points by which his friends recognize him in the street when he is fifty or a hundred yards away. They are far more important in a portrait than map-like details of the features. Look for these characteristics. Approach every sitter with an open mind.

It is useless to put a man in some predetermined position and pose him to suit your notion of how he should appear. Of course, many of the natural attitudes that a man takes up are quite impossible from a photographic point of view. But, watch for what you want, and when you see it, do as Rodin does—prolong it.—*Professional Photographer.*

Clothes and Pose

THE right rendering of a sitter's clothes may give the photographer as much trouble as the sitter himself, or rather, in this case, herself. One has to remember that little imperfections in the hang of a garment, which may not be noticed unless specially looked for at the time of posing, may be conspicuous in the finished print. In this particular ladies are generally more exacting than men; though when a man is fussy about his costume he is far harder to please. When there has been much trying of different positions, shifting this way and that, as one pose after another is found to be not quite what is wanted, the clothes are almost sure not to set right. In such a case, when the actual position for the photograph is decided upon, the best plan is to call the attention of the sitter to its various characteristics, and then let her abandon it for a few moments, resuming it afterward straight away. If the interval is spent in a walk across the studio, or in some other free movement, any dragging of the costume will be remedied of itself and in all probability there will only be a very little to do in the way of arranging. It is hardly necessary to say that whatever arranging may be thought necessary should not appear as such in the picture. Anything that hangs must seem to hang quite naturally, however carefully it may have been necessary to place it in the exact position required. When draping is done it should at least appear to be free and natural, and not dragged this way and that to show a rounded shoulder or to conceal a hollow in the neck. An easy plan is to determine before attempting the actual draping what is to be done, and then to endeavor to do it straight-away, or at least with the very minimum of alteration. With most lady sitters an easier method still is to show them what is required and leave them to carry it out.—*Photography*.

Still-life Work

PHOTOGRAPHERS who make their first attempts at groups of flowers or fruit are sometimes misled by the advice that is given them to use mounting boards as backgrounds, without the qualification being added that only cold shades of gray should be employed. The warmer tones do not photograph at all as they look, and there are curious irregularities about them.

Such colors usually come much darker, even on orthochromatic plates, but there are exceptions. The writer once did a great deal of photography in a room papered with a pale reddish paper with no pattern on it at all. It made a very good background when one got used to it and realized how it would come out, which, in spite of its tint, was not far short of white.

For this reason, then, it is best to keep to white, black, and intermediate shades of gray, of which any dealer in art mounting papers or in crayon papers has a wide variety.

Instead of buying such papers for backgrounds, we may use cardboard painted over with distemper. This can be made on a small scale by dissolving a pound of size with its own bulk of

hot water, and then mixing in with it a thick cream of whiting and water, to which a trace of blue may be added to make it look a little whiter; it will not affect its photography. The white can be toned down by the addition of water-color ivory-black, adding a little, well mixing it in, and painting a sheet of card with the mixture. Then more black may be added and another sheet painted, then more, and so on. Each sheet of card may be painted on both sides with two different shades, and in this way four sheets will give us eight tones, which will be ample for all ordinary requirements. The distemper will be found to dry much lighter than it appears when wet, and this must be allowed for.—*Photography*.

Reflections

WHEN we come unexpectedly upon a beautifully clear sheet of water, reflecting the banks and woodland round it and the sky above, the delight which so beautiful a spectacle gives us often leads to the camera being set up and a plate exposed. From a pictorial point of view such an exposure is usually a failure, however perfectly the reflection may be recorded; and it is not difficult to find the reason for this.

In the first place, the pleasure given by the sight of very perfect reflection is due to circumstances which the photograph mostly leaves out of count. The reflected picture depends very largely upon its coloring, and we should need an Autochrome or a Paget to record that. A little critical comparison of the original with the reflection will show us that the colors in the reflection are very much more intense than they are in the original, and the color contrasts are consequently all greater.

Physicists explain this as due to the suppression of much of the white light which reaches our eyes from the direct view and dilutes all the coloring. Owing to the phenomena connected with the polarization of light, the reflection from the water neutralizes a great deal of this white light, and so intensifies the coloring.

This phenomenon is particularly noticeable in the case of a landscape with a blue sky with white clouds. The blue is very much more intense in the reflection, and we may often see fleecy white clouds standing out strongly against it, which when we raise our eyes and look at the sky itself are quite hard to find. In fact, it has been suggested that use should be made of this phenomenon to secure cloud pictures.

Brilliance of coloring being necessarily lost in the photograph, the reflection looks dull and heavy, and, except as a reminder to the person who took it of the beauty of the scene, the picture is disappointing.

There is another reason why a very perfect reflection is pictorially unsatisfactory, and that is connected directly with its very perfection. Balance in a picture is a necessity, but exact symmetry is a fault. A landscape, however well composed in itself, when duplicated upside down by a reflection is spoiled. A broken reflection may help it, but a perfect reflection never. Most of us, at some time or other, have got photographs which can be looked at either

way, so exact is the duplication, but then they are only curiosities.

This matter is made worse when, as often happens, the reflecting surface is a river with sloping, tree-covered banks. The photograph then may be symmetrical both ways, a V-shaped sky at top between the trees, and an inverted V-shaped reflection between reflected trees, the lines of the subject having an X-like form.

These and other reasons, to go into which would involve a lengthy consideration of the whole subject of pictorial representation, lead us to the conclusion that the perfect, mirror-like reproduction of a landscape in calm water, beautiful as it is to the eye, has an appeal which cannot be conveyed by any camera rendering. It is a thing to be enjoyed in the reality for its beauty of coloring and rich suggestiveness; but it is hardly a thing to be photographed, except for a personal memento.—*Photography*.

A Simple Process for Making Sepia Paper with the Salts of Iron

THE production of photographic prints in sepia by the platinum and gelatin process is well known and understood by photographers generally. There is another method of obtaining sepia prints by the use of the salts of iron. The process for preparing the paper is extremely simple and easy in manipulation, so that anyone desirous of making their own brown prints or sepia paper can readily do so.

Some classes of work demand a cheap paper for producing sepia prints, and the process about to be described will, in most cases, meet the requirements.

It will be necessary, in the first place, to select suitable paper, because any kind of paper cannot be used; most of the commercial papers contain impurities that would give results which would prove unsatisfactory, producing metal spots and other defects. The special plain papers sold by large photographic stock dealers is entirely satisfactory, and can be purchased in sheets at 50 cents per dozen. The heavier rough-surface papers are also suitable, and Whatman's hot-pressed drawing paper can also be used. The only defect of the latter is that the finished print is somewhat hard and contrasty; if a negative is used with this paper that is a little thin, then excellent prints can be obtained. It will be necessary to have a drying closet heated to 120° F., in which to suspend the paper as soon as it is coated. Quick drying produces a paper that enables the printed image to keep well upon the surface. A few clean wood photographic clips will be required, which should be kept entirely for this class of work.

The sensitizing solution is made up as follows:

Distilled water	8 oz.
Ammonia citrate of iron	384 gr.
Nitrate of silver	80 gr.
Tartaric acid	80 gr.
Gelatin	60 gr.

Soak and dissolve the gelatin in a portion of the water; also the nitrate of silver and tartaric acid, using three ounces of water to dissolve the iron

salt in. When all are dissolved, mix together and filter; pour this mixture into a clean porcelain or glass tray and float the paper thereon. Raise the paper, allow the excess of solution to drain back into the tray by placing one of the corners of the paper against one corner of the tray, then suspend it in the drying closet. These operations must be conducted under a weak yellow light, because both the sensitizing solution and the coated paper are very sensitive; in fact, the sensitiveness is four or five times as great as blue-print paper. As soon as the paper is dry it must receive a second coating, taking care to reverse the position of the sheet of paper when replaced in the drying closet.

A moderate quantity of this paper should be prepared for use and used up without too much delay between the time of coating and printing. The printing must be made moderately deep, and as soon as the prints are made they should be placed into clean cold water, and washed three or four times, then placed into a very weak solution of hyposulphite of soda, made up of hyposulphite of soda, $\frac{1}{4}$ ounce; water, 25 ounces. A few minutes will suffice to fix out any trace of the salts of silver. The prints should then be washed in half a dozen changes of clean water, blotted off in clean blotters, then suspended by a clean wooden clip to dry. If a number of sheets of paper of different surfaces have been coated, it is advisable to roll the paper upon itself, wrap it in a sheet of hard glazed tissue paper (the kind that is made to imitate waxed paper), then place it in a suitable tin case—those that are used for the storage of platinum paper are well suited for this purpose—and the lid of the tin case bound round with a piece of rubber tape, such as is used for bicycle tires. This will ensure a fairly good air-tight joint.

A few trial prints should be made from different kinds of negatives, which will soon enable the printer to ascertain the best class of negative for the work. Care must be taken not to have the hypo solution at all strong, otherwise the image will bleach too much and the color will also not be satisfactory. The solution will not keep when once mixed, so no more should be made up than is required for the amount of paper to be coated.

Portraits at Home

WHY are professionals generally so shy about taking up at-home portraiture? It is profitable work and there is plenty of it; yet it is practically untouched by the majority of photographers. There is nothing undignified about it; and, where the photographer has any ability for adapting his methods to circumstances, there is nothing very difficult in it.

The first thing to consider is how to get the work. No definite laws can be made on this point. The methods must vary according to the needs of different districts. The local photographer knows his own neighborhood best. There are very few districts, however, where a neat, well-worded circular would not be effective. Many people have decided objections to visiting

a studio, and others, through ill-health, cannot leave their homes. It could be pointed out to these people that photographic processes and methods of working have been so much improved in recent years that there is now no need to go to a studio to get a good portrait, but that excellent pictures can be taken in their own rooms.

Another good plan is to get a few good specimens of home portraits, and to draw special attention to them in your window or show-case. It is also a common practice for a photographer, when he has an appointment in a certain district, to choose a few good residents and write to them stating that he will be working in their neighborhood on such a day, and that if they require any home portraits taken, he will be pleased to make an appointment. It may be that some old lady has been promising her family for years that she will have her photograph taken one of these days; the letter arrives and the family use it as a means of inducing the old lady to make up her mind. This method is quite successful, but many professionals consider it undignified. There are many other ways of securing orders, but the man with the business-getting instinct will soon find them out for himself, once he is convinced that the business is there.

Having secured an order, the next point is to carry it out. Light is the first consideration. Professionals who work in studios and who rarely attempt to make portraits anywhere else are apt to magnify the difficulties in getting well-lighted home pictures. The average drawing-room is not a bad place for portraiture. If, however, you should be asked to work in a drawing-room on the ground floor, where the light is obstructed by trees or buildings, ask to be allowed to see the rooms upstairs. Very often a small room with a large window, where the light is not obstructed, can be found, and made into an excellent studio. All operators will understand that, where possible, the window should not have the sun shining through it.

A reflector will be necessary to relieve the shadows. If you do not carry one in your outfit, you can make one by hanging a sheet over a clothes-horse or the back of a chair. A very good head-screen can be made by stretching butter muslin over a child's hoop. By fastening a walking-stick to it, it can be held between the window and the sitter's head during exposure. At this time of the year, when the hours of daylight are few, it is a good plan to be prepared with a small flash-lamp.

Because sitters are photographed in their own homes it does not follow that the portrait need be subordinated to chairs, tables, and wall-paper. The background should be watched very carefully; old china, brass candlesticks, or other objects with reflecting surfaces, should be removed from behind the sitter. When the pattern of the wall-paper is obtrusive, it can be covered by a background. If you are not provided with a complete home portrait outfit, which includes a background, the simplest way is to have a light flexible ground tacked to a roller, and to fasten the material to the wall with push-pins and let the roller hang down. The weight of the roller keeps the background taut.

With regard to apparatus, remember that you are going to a customer's private house. Therefore do not go with a battered old camera under your arm and a muddy tripod over your shoulder. Have the camera and fittings in smart-looking cases, and have the tripod folded up and neatly strapped. Your whole outfit should be smart and professional-looking. Nothing looks worse than to go into a well-furnished drawing-room and to set up a dilapidated old camera. Don't think that customers take no notice of your apparatus; they do notice it—and they notice your boots and clothes also.

You cannot as a rule use long-focus lenses, because most of your work will be in cramped spaces. Two good lenses will be all that you require. One should be a good anastigmat, working at a large aperture; and the other a wide-angle lens for taking rooms or for working in very confined spaces.

The tripod should be fitted with stays to prevent slipping. If the ordinary field tripod is used, corks on the points of the legs will keep it from slipping on stone or polished hardwood floors.

Other matters such as posing, lighting, getting the sitter's attention, and exposure can very well be left to the knowledge and experience you have gained in the studio.

There is a growing demand for home portraiture, and the demand will continue to grow.—*Professional Photography.*

Blue Prints

THE following formula by Dr. Lux in the *Papier Zeitung* will be useful to those who coat their own paper:

For a very hard, smooth-surfaced, wood-pulp paper the following is recommended:

A	
Green ammonio-citrate of iron	2 ozs.
Water	4 ozs.

B	
Potassium ferricyanide	320 grs.
Water	2 ozs.

C	
Dextrine	96 grs.
Water	2 ozs.

D	
Potassium bichromate	1 gr.
Water	10 mins.

These are then mixed together to obtain sufficient sensitizing solution on the surface and the bichromate makes it insoluble.

For a very soft paper with plenty of linen the sensitizer should be:

Green ammonio-citrate	2 ozs.
Water	4 ozs.
Potassium ferricyanide	320 grs.
Water	12 ozs.

Papers prepared with these solutions will keep for a month; if ten grains of oxalic acid be added a more sensitive surface is obtained, but the papers do not keep so long in perfect condition.

Better Bromides by Redevelopment

It may be stated as an incontrovertible fact that on bromide paper, prints, whether made direct or by enlargement, may be improved, not only as regards the scale of gradation, but also in respect of color. The operation is so simple, carried out as it is, not in the dark-room, but in full artificial or daylight, that it behooves every worker who desires to get the best out of his negatives to give it a trial.

The writer has been interested in this branch of bromide work for a considerable time, and although all the available formulæ were given a trial, regularity of result could not be depended upon. As in the case of the little girl, "when they were good, they were very, very good; but when they were bad, they were horrid." The horridness took the form of pinkish and brown stains extending over the greater part of the surface of fully 50 per cent. of the prints, and these stains could not be avoided, in spite of the most scrupulous attention to washing. It appeared, therefore, that the existing formulæ required improving, and a somewhat extended series of experiments enables the following instructions to be given with a feeling of confidence that successful results will be obtained.

Two methods are open according as a cold engraving black or a warm black tone is wanted; for the first of these the following bleaching solution is prepared:

Copper sulphate	240 gr.
Sodium chloride (cooking salt)	120 gr.
Sulphuric acid	20 min.
Water	12 oz.

Extreme nicety of weighing is unnecessary, and an avoirdupois $\frac{1}{2}$ and $\frac{1}{4}$ ounce may conveniently be taken.

The bromide print, made in the usual way with any developer preferred, fixed, washed, and dried, is soaked a few seconds in water, and then flowed with an ounce or so of the bleacher. After the image has been converted to a pale brown, the solution is poured away, and the print washed in running water for five minutes, longer washing being not only unnecessary but injurious. Here let it be said with emphasis that the bleaching solution once used, must be discarded; to return it to the stock bottle, from a mistaken idea of economy, is to solicit trouble for the future.

The print is now ready for redevelopment, and one, and only one, developer may with certainty of result be employed, namely, acid amidol. The bleacher is acid, and practice has proved that the developer should be acid also. It is prepared at the time of using by dissolving a small teaspoonful of sodium sulphite (the anhydrous form is handy, owing to its ready solubility) in 3 ounces of water, and adding a small saltspoonful of amidol and about 30 minims of sodium bisulphite lye; this is sufficient for a couple of 12 by 10's. Theoretically, a second fixation should not be necessary, but tests with sulphide have revealed the presence of unconverted silver chloride, even when development appeared complete

and a brief immersion, say a couple of minutes, in the usual hypo bath should now be given; a sufficient wash completes the operation.

To obtain a warm black tone, the print is bleached in a solution consisting of a teaspoonful of common salt dissolved in a couple of ounces of water, to which is added 1 dram of sulphuric acid, and sufficient of a strong solution of potash permanganate to give it a rich crimson color. As bleaching proceeds, the solution loses color, and further small additions of permanganate are made until the image has entirely vanished. If sufficient salt and sulphuric acid are used, there will be no staining, and a wash for a minute or two will leave the print pure white and ready for redevelopment.

The same developer, acid amidol, is employed, but development will be rather slow unless the dish is carried out of doors and held under the sky, when it will be complete in about one minute if the daylight is good.

When the nature of the subject calls for a less intense color than black, a rich dark sepia is obtained by the application of ammonium sulphide, 30 minims to 2 ounces water after the use of this bleacher.

NOTE.—Sodium bisulphite lye consists of:

Sodium sulphite (cryst.) (or anhydrous, 2½ oz.)	5 oz.
Sulphuric acid	6 drams
Water	10 oz.

The sulphuric acid is poured into the water, the sodium sulphite added, and the bottle is shaken until solution is complete.

This lye is a valuable addition to fixing baths for negatives and bromide prints in the proportion of about 3 drams per pint of bath.—*Amateur Photographer.*

Random Notes

MANY professionals do not realize how much their work should be improved by the use of a long-focus lens. Examples of distorted perspective, caused by working with the camera too near the sitter, can be seen in many windows and showcases. There are bust portraits with the near shoulders looming up half as large again as the far shoulders; there are three-quarter lengths with hands out of all proportion; and there are large heads with noses that look so bulbous that they are a libel on the sitters.

In some studios a short-focus lens is the only one that can be used when full or three-quarter length portraits have to be taken. In these studios, however, the operator should be able to use a fairly long-focus lens for his bust portraits, even if he has to change his lens for the styles. There is always a danger, where space is limited, of getting into the habit of making one lens do for all kinds of work. When this happens, the bad effects are very soon seen in the portraits.

Apart from the question of focal length, the choice of a lens is essentially a matter of personal taste—like the choice of a wife. How should anyone else know whether you are likely to fancy an anastigmatic brunette or a soft-focus

blonde? Many of the leading professionals use modern anastigmats, whereas other shining lights in portraiture stick to the old types of portrait lenses. Some go in for clean-cut detail in their negatives and get softness by various dodges in printing; whereas others prefer to get softness by using a lens that gives diffusion.

Here are a few useful Don'ts for air-brush workers: Don't use the ink too thick; the consistency of writing ink is about right. Don't forget to clean the air-brush after using it. Don't lay the air-brush down on a table or other flat surface; hang it upright in the clip provided for the purpose. Don't put your finger over the front of the air-brush to see whether the needle is sharp; you will find that it is, but after being touched a few times it will be no longer straight. Don't let anyone but an expert try to repair your air-brush; send it to the makers.—*Professional Photographer*.

Masking Lantern Slides

WHEN masking lantern slides, trouble is sometimes experienced in getting all corners of the mask right angles. To cut out the mask in thin opaque paper is perhaps the best mode of procedure, but when slides are wanted in a hurry and in large numbers this method often takes too long. The following method has proved exceedingly useful, being at the same time quick and efficient: Obtain a sheet of squared paper used for mathematics and obtainable at most stationers. This is usually ruled in inch squares, and again subdivided with fainter lines into tenth of an inch squares. If the slide is placed with the film side up and with the squared paper beneath, the lines should just show through. Incidentally the extent to which the lines show through the slide gives some guide as to whether the slide is of the correct density. The first side of the slide is then masked with a binding strip slightly moistened. This strip is placed along the slide, using the line underneath as a guide. The next strip is then placed along any convenient line, which will, of course, be exactly at right angles, and so on until all sides have been masked. One strip for each side is usually sufficient, but two or more can be used if necessary to cover the space. With a little practice this method can be carried out very quickly, with certainty of getting all corners right angles.—*Amateur Photographer*.

Magnifiers

MAGNIFIERS used on cameras which can be focussed alter the f number in the same way and to precisely the same extent as they alter the size of the image of a distant object. If this is halved, the f numbers will be halved also, and so on.

Positive or magnifying lenses shorten the focus of the lenses with which they are used; negative or reducing lenses lengthen it.

All combinations of camera lenses and magnifiers are makeshifts. They may serve, but not so well as a complete lens of the required focus would do.—*Photography*.

PATENT NEWS

Under this heading it is proposed to include each month a list of all the U. S. Patents; and brief abstracts of the more important, and to include also such foreign patents as present special features.

Copies of any patent can be obtained from the Commissioner of Patents, Washington, D. C. Price, five cents each.

Exposure Meter. W. W. Venable. 1207448.

Film Device. H. K. Hennigh. 1207036.

Developing Process. F. W. Hochstetter. 1207042.

Photographic Process. W. F. Fox. 1207527.

Apparatus for Color Work. W. H. Doherty. 1207513.

M. P. Film Holder. W. W. Kercher. 1207298.

M. P. Film Winder. N. Power. 1207211.

Range Finder. R. Bennett and R. E. Cox. 1207475.

Method of Obtaining Ultra-violet Rays. J. von Kowalske-Wierrisz. 1207347.

Finder. J. F. Polhemus. 1206372.

Color Photography. I. Kitsee. 1206000.

Projection Apparatus. L. J. Auerbacher. 1206287.

Toy M. P. Machine. H. V. Ashby. 1206286.

M. P. Projector. E. A. Ivatts. 1205996.

M. P. Machine. G. W. Nusbaum. 1206357.

Camera. H. I. Williams. 1208066.

Camera Device. E. S. McAll. 1208344.

Camera. H. L. Ide. 1208320.

Camera. H. L. Ide. 1208321.

Camera Attachment. J. R. Montague. 1208617.

Film Holder. L. J. R. Holst. 1208558.

Shutter Attachment. J. E. Payne. 1208711.

M. P. Apparatus. H. Russak and O. V. Hanstein. 1208664.

Dental Film Apparatus. H. F. Waite. 1208244.

M. P. Apparatus. N. Power. 1208646.

M. P. Apparatus. N. Power. 1208647.

M. P. Apparatus. I. Kitsee. 1208573.

Photographic Apparatus. A. H. Wynkoop. 1208071.

Photometer. A. Blondel. 1208279.

M. P. Apparatus. L. Stanek. 1208685.

M. P. Apparatus. D. F. Comstock. 1208490.

X-ray Apparatus. E. W. Caldwell. 1208474.

X-ray Tube. C. A. Friedrich. 1208128.

Magazine Camera. J. P. Hansen. 1210164.

Camera Device. W. H. Morris. 1209745.

M. P. Apparatus. J. G. G. Ross. 1210212.

M. P. Apparatus. R. N. Wilkinson, Jr. 1210241.

Finder. J. Becker. 1210134.

Finder. J. Becker. 1210135.

Finder. J. Becker. 1210137.

Focus Finder. J. Becker. 1210136.

Film Drier. L. Gaumont. 1209696.

Mounting Device. A. E. B. Smith. 1210226.

M. P. Apparatus. F. C. Hamilton. 1210063.

M. P. Apparatus. N. Power. 1209755.

M. P. Film Reel. L. Sollisch. 1210113.

M. P. Device. N. Power. 1210203.

M. P. Apparatus. F. C. Hamilton. 1210064.

X-ray Apparatus. F. L. Satterle, Jr. 1210215.

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PROFESSIONAL PORTRAITS OF CHILDREN

By JOHN A. TENNANT

PERHAPS the most obvious mistake made by professionals in their portraiture of children lies in the lack of reverence and simplicity which marks their treatment of children as subjects. The influence of environment, the effect of the strangeness of the studio and its methods upon the child, are points which rarely receive much consideration, although they exercise a real and direct influence upon the result of the sitting. The beautiful reserve of childhood, the natural sensitiveness and dignity which restrain most children from any familiarity with strangers until there has come a mutual understanding, are things which the average professional recognizes only to brush aside as undesirable. His method, as my observation has told me, is to carry the child through the sitting on a wave of excitement. There is a feverish and noisy activity in all his dealings with the little ones from the flurry of "fixing up" both children and the studio for the event to the end of the performance under the skylight. The shake-up

in the studio, the hurried rearrangement of accessories, the exaggerated funniness of the operator, the anxiety of the mother or nurse accompanying the child, and the general hubbub all combine to develop in the little sitter the very qualities which make a successful portrait the most remote of possibilities. What is the remedy? Granted for the moment that the photographer has a strong liking for children and is willing to take the pains so essential to the best results, how shall he overcome the real difficulties created by the strangeness of the place and its people, and make pictures portraying his little visitors as they are in the familiar environment of home life?

A great deal may be accomplished by taking away from the studio-methods all that emphasizes its unlikeness to home and its surroundings. Let special appointments be made for children's portraits wherever possible, and set apart a children's reception or waiting-room for their sole use. Furnish this room in a simple but attractive way with pictures

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of children, furniture suitable for juvenile uses, a few toys, animals, and a simple game or two to beguile the time of waiting. A large music-box, set into the wall as a fixture, will often prove itself a potent charm with timid or obstinate children. That the room should be clean, bright, and sunny, cool in summer and warm in winter, goes without saying. The aim in all this is, of course, to put the child at its ease and to overcome any feeling of constraint or shyness. The photographer should meet his little visitors in this room, and in a few minutes or after a half-hour's wooing, perhaps, become acquainted with the general characteristics of his subject before the sitting begins. Those who accompany the children should be warned, if needs be, not to discuss the sitting, or to instruct their charges concerning their be-

pleted, so that when the child comes under the skylight the place is quiet and ready for the sitting. One assistant to change the plates, or focus, may generally be retained at the camera with advantage, although this was not followed by such skilled workers as Mr. Core. The assistant should be well trained to play his part without attracting attention. Wherever possible *all*



BY E. B. CORE, NEW YORK

havior, or bother them with too much preparation. Everything else being favorable, the children's brief stay in such a room cannot have but a good effect on the after-work. It should, indeed, convey the impression that the photographer's studio is almost as nice a place as the familiar play-room at home.

Meanwhile, all the preparations necessary in the studio should have been com-



BY E. B. CORE, NEW YORK

friends and relatives should be kept out of the studio during the sitting, but most often it will be needful (essential with young children) to permit a single helper to accompany the child.

In the general handling of children the photographer must be guided by his quick perception of the character of the child with whom he has to deal. Some children are easily excitable, and care must be taken not to rouse them overmuch; others are retiring and lacking in animation for one cause or another. These latter may be skilfully interested by the use of a little diplomacy. The photographer is usually a good judge of character, acquiring the habit uncon-



BY O. M. GATSCHENE
THE BURKHOLDER STUDIO
MANSFIELD, OHIO



sciously in his daily work, but he will need all his knowledge of human nature for successful work with children. Thus he should know how to tell the sick child from one that is well; the peevish, fretful, nervous child from one laboring under temporary timidity. Some children require a little "fuss" before they will be "drawn out;" with others quietness is the easiest way to win; and some are best left severely alone. A display of noise and bustle is the common blunder, and the lavish use of novelties of one sort or another may also be mentioned as requiring restraint. One thing is certain, if friends or relatives are permitted to be present at the sitting they should not be allowed to interfere with or instruct the child. In dealing with very timid or young children the mother or friend may advantageously help in any physical handling of the child—this detail being one to which many children are strangely sensitive—but her help should be given with eye and hand rather than by word of mouth. In other words, the sitting should be as far as possible a matter between the photographer and his subject, free from outside interruption or interference.

With very young children difficulty will be experienced in getting their attention directed to any one spot for the moment needed for exposure. The best course to follow in such cases is to get the focus, put in the plate ready for exposure, and then, in absolute quietness, gently tap the floor. This will generally attract the attention of the child without alarming it or causing movement, and the opportunity for exposure is gained. With older children whose attention wanders from one thing to another without resting on any one thing long enough for our purpose, the undemonstrative recital of a childish tale will often secure the degree of repose necessary. The vivacious child, of course, can be managed by being "let into the game" and impressed with the feeling that the success of the affair rests upon him. Or we may busy our subjects with some simple occupation, picture-book, or toy, and at the desired moment get their attention for the exposure. Mr. Nast, after long experience with children under the skylight,

advises the use of the singing voice as an excellent way of gaining the interest of dull or indifferent children. By this he means the photographer to sing the necessary directions instead of speaking them. This may arouse apprehensions as to the photographer's sanity in the minds of older people present, but we are told that the children enjoy the method; and the sparkle and brightness of animation are what we seek. Sometimes young children will persist in making "funny mouths," especially when the little teeth are coming. This can be overcome in part by touching the tongue with a small pinch of salt, which causes the child to close its mouth for a moment, during which the exposures should be made.

There is a common desire among mothers for a picture of baby smiling. Don't indulge it without an attempt at a second picture without the smile. A smile is pleasing at a first glance, but one wearies of it in a picture, where it cannot change. Babies have as many moods as older folk and are interesting in every mood, but the smiling baby does not wear well. Get the child interested, listening, looking for something or busy with its toes, and you will be just as gratefully remembered as if you had caught the smile.

As far as posing is concerned, the less said the better. Children from one to eight years are graceful in every move, that is, in free and spontaneous movement. From eight to fourteen years there is a little awkwardness, and simple poses will be most successful. With girls the three-quarter or full-length figure may be attempted; with boys the full figure should generally be avoided. But there are exceptions always. For my part I prefer the method of letting the children loose in the studio, keeping them interested, and using a plate at every opportunity. This "wastes" plates, but insures variety of pose and expression, absolute spontaneity, and now and again a picture which could not be obtained by a hundred deliberate poses. Some have a movable platform—which moves easily and noiselessly—and many most delightful pictures of children have been secured by its aid between "rides" and "talks." This method, of



BY THE BACHRACH STUDIO, BALTIMORE, MD.

course, is in keeping with "home" methods.

Where two or three children of the same family are to be photographed together, many pleasing combinations may be had by interlocking the figures in such a way as to secure unity and yet keeping a desirable degree of separation in the figures. I have seen a clever example of this, offering a suggestion not yet made common. A group of four children—three girls and a boy—was arranged so as to display an oblique line of heads in profile, with the figures intertwined here and there by linking the arms of two of the children. The balance of the upper portion of the composition was secured by lettering the children's names in the upper left hand of the background, while the lower

portion of the picture was held together by the lines and masses of the draperies.

In dealing with babies (clothed) care is needed to see that the child is not lost in a mass of white linen. It is usually a difficult thing to get a picture of a young baby showing the whole of the face and hands or feet because of the superabundance of clothing *and* ribbons, but it can be done by patiently watching for the right moment. With babies minus any clothing we must strive for a pleasing outline, avoiding unsightly creases over the abdomen, etc. The full figure of a child without clothing is a favorite style with some mothers, but is seldom beautiful. The half-figure is generally preferable, but this is governed by circumstance.

INTENSIFYING WITH URANIUM

By NORMAN BUTLER

THERE are only two safe ways that I know of to intensify a negative.

One is, don't do it. The other is, use uranium. For some reason, no doubt a very good one, uranium intensification is taboo, generally. Just the same, I have found it the quickest, easiest and surest method, all things considered, that there is of giving any desired amount of extra "punch" to a weak negative. It has one decided disadvantage, but it has also two or three advantages that far outweigh the one fault. This fault is that negatives treated with uranium do not keep well. In time, sometimes within a few weeks, an iridescent stain forms around the edges and gradually extends inward toward the center, finally covering the whole plate. This stain is fatal to even printing, and I have never discovered any cure for it, although there are ways out of this difficulty which I will mention later on. But to offset this fault there is the very great virtue that if for any reason the intensification obtained is unsatisfactory—that is, too weak or too strong or uneven—it may in a few seconds be dissolved entirely off and the negative restored to its former state, ready to be re-intensified if desired. It is thus guaranteed absolutely fool-proof so far as permanent damage to a valuable negative is concerned, and the merest tyro may contemplate intensification without violent palpitation of the heart.

It belongs to that class of intensifiers whose function consists in changing the color of the image from black to yellow or brown, improving the printing quality, just as pyro stain frequently does. In fact, a negative slightly intensified with uranium looks like a pyro-developed negative where the minimum of sulphite was used. Further intensification simply means deepening the stain, and this may be carried so far (and in only a few seconds, too) that it would take hours to print, and the contrasts would be tremendous.

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It is my experience that it does not make much difference what kind of a negative it is that requires treatment—what the cause of the weakness was, that is. It may be an undertimed-underdeveloped or an overtimed-underdeveloped negative. An undertimed-overdeveloped negative is hopeless, of course, so far as any intensification that increases contrast is concerned. A negative that has been fully exposed but underdeveloped simply needs "brightening up," and for this purpose uranium cannot be beat. A negative that has been both underexposed and underdeveloped needs shadow detail brought up to printing quality. And with uranium I have seen shadow detail brought to light that was simply not visible before intensification!

The intensification is nice and clean; it is clear, and not muddy like that of some of the prepared one-solution intensifiers. It is entirely free from grainy appearance and so is fine for negatives that must be enlarged.

As to formula, the one I use is as follows:

Pure water	16 oz.
Uranium nitrate	35 gr.
Potassium ferricyanide	35 gr.
Acetic acid No. 8	1 dr.

This contains twice as much water as the formula I got from the books—or a book—some time, somewhere. My experience is that the strength does not matter much, except that the stronger solution works very rapidly—too rapidly for comfort. In fact, with the much weaker solution I usually get all the "pluck" I want in a negative in twenty to thirty seconds, certainly in less than a minute. I suppose the function of the acid is to neutralize any possible alkalinity in the water. As it is possible with an alkaline solution (say a little sodium carbonate in water) to dissolve all intensification off, no matter how intense, it is obvious that any alkalinity present in the intensifying solution would be fatal to good results. So I believe

the acid is used to insure the absence of alkali. (I suppose some chemistry shark will laugh at my chemistry here, and I confess I am only trying to make a little common sense make up for a lack of knowledge of experimental chemistry, but at any rate I have done such a thing as to intensify without the acid, "taking a chance," and the acidless formula functioned all right.)

For the same reason a negative must have been thoroughly washed—free from hypo. Otherwise unintensified areas will result. The uranium will not "take" where hypo is present. If you have any suspicions on the subject you may soak the negative a minute or two in a weak acid bath. (I use the acid shortstop bath that I use for paper, which is always ready.) The negative may be put into the intensifier dry, but it is better to soak it in water first, say half an hour.

The solution must be made fresh at the time of use. It does not keep long; in fact, not much longer than it takes to perform the operation.

Lay the negative in a tray (preferably a white one, so that the amount of intensification can be easily observed), and pour the solution on with a movement like that in pouring on developer, being sure, that is, that the solution covers the whole plate evenly and quickly, as intensification commences instantly and advances rapidly. Very little goes a good way, you will find, and increases a little, apparently, during the washing afterwards. The danger is to over-intensify. Nine times out of ten when the negative is dry you will find that you have more intensification than you thought you had. Oftentimes merely to change the color of the image *slightly* is enough—it is surprising how little is needed to make a lot of difference. After intensifying swab the negative off well, front and back, with cotton, and wash fifteen minutes or so.

But—and here is the chief value of the process—if for any reason you are not satisfied with what you have got, put the negative into a weak alkaline solution (I use about half a teaspoonful of sodium carbonate in eight ounces of water), and in a few seconds the negative is right back where you started—no better nor

worse off than before. If your intention is to re-intensify, wash and acidify the negative again, of course, and proceed as before. Or, in case of under-intensification the first time, soak up and add a second dose right on top of the first.

Another use of uranium intensification which has no doubt been advocated before, although I do not recall ever having seen it mentioned, and one which makes it extremely valuable at times, is that local intensification may be easily and surely carried out. To perform the operation you take advantage of the dissolving-off property. It is possible by intensifying the whole of a negative and then dissolving off part of the intensification with a solution of sodium carbonate to even up intensities. It is best to do the local reduction while the negative is wet, but I have successfully worked it on a dry negative with a wad of cotton not too wet.

To give an illustration, I have in mind a negative I made not long ago of a child in a white dress. The quickest possible bulb exposure was made, and the subject was practically facing the light, but back a considerable distance from the window. It was a head and shoulders picture. The plate was developed to the limit—result, an exceedingly thin image of a face, but a white dress that you couldn't print through in a week of Sundays. Well, I intensified the whole negative with uranium and then dissolved off all the intensification from the dress portion. The print I finally got from the negative showed no signs of negative-tampering.

Perhaps the leading objection to uranium intensification is the fact already mentioned that negatives so treated do not keep well. But there are two roads around this obstacle. One is, to dissolve the intensification off after the prints are made, carefully washing the negative afterwards, of course; then if in the course of time more prints are wanted re-intensify as before. The other way is to make a duplicate negative from the intensified one, by way of the transparency route, or make a glossy print from which a new negative can be made at any time it is wanted.

One experience alone was enough to convince me of the value of the method,

and I state it merely to show another application. It is one of the things that happen occasionally to the professional photographer particularly. I had made a negative of a child under bad lighting conditions, so that the thing was very weak on account of under-exposure. But I sent a proof of it along with others of the same sitting, thinking that if it should be selected it would be an easy matter to intensify. Of course, the mother did select it, among others. That's a way they have! The proofs were gas-light prints and this particular one was weak and gray in the background, which was simply blank space without detail of any sort. I carried out my original intention of intensifying for the finished

prints. The result was a startling improvement—to *me*. The mother of the child was disappointed. She said she liked the proof better. She preferred the light, gray effect. So she returned those prints and asked me if I would make them over again as much like the proof as possible. And here the negative was intensified! But I had sufficient reasons for wishing to please the lady if possible, my art-conscience was not in too good working order, and I felt in an obliging mood. So I simply removed the intensification I had been at such pains to put on and made finished prints from the negative in exactly its original state. Easy enough!—and another added to my long list of pleased patrons!

M. LOUISE GREENE, PHOTOGRAPHER OF CHILDREN

By BERTHA L. COLLINS

"IN painting and sculpture women have always reached the height where very few men ever tread. I believe the same can be done with the lens." It was this remark that led me to look into the studio of M. Louise Greene, at Morristown, N. J. Mrs. Greene is a self-made photographer and loves her work because she cannot help it. Starting several years ago to do amateur work for her friends, she today has the reputation of producing some of the finest pictures of children that have come before the public. It is the psychological moment before pressing the bulb that is of great importance, according to her idea, and in her pictures she keeps the natural grace of paintings in the pose, together with richness in tone which has distinguished her work and placed her in the upper circles of the profession. Culture and technical knowledge in one who is faithful to the art produces inevitable results. As photography is truly a woman's work, it brings out in her natural refinement, social tact and originality, and thus draws from the art much

more than can be fully realized when there is an exchange of thought among coworkers.

Mrs. Greene has taken several prizes in professional exhibitions, and has spent a few years studying under the guidance of the late George Rockwood, the pioneer photographer of New York. She has a modest little studio laid out on a home plan on one of the principal streets of Morristown. The scheme of coloring is green throughout, which is suggestive of the worker's name, while ferns and flowers heighten the artistic arrangement of the place, and the numerous photographs displayed add a brightness to the room that can only come from the smiling faces of happy children. When one enters and is greeted by the cheerful smile of the artist herself, a feeling of cordiality comes to the surface and you are friends at once.

Mrs. Greene's special work is children's photographs, and she has an unusual personal magnetism that attracts every child she meets. All the children

have a "good time" when they come to "Auntie" Greene's studio. She treats children naturally and permits them to reveal their true natures as she photographs them. One of the rooms in the studio resembles a nursery, with its quantity of toys and dolls, kept there expressly for the little ones.



BY M. L. GREENE, MORRISTOWN, N. J.

As you are ushered into the reception room, perhaps a friendly kitten will purr against you, or you may arrive in time to attend one of the tea parties that are sometimes given right under the skylight. Frequently the kittens are invited to the tea and dressed up for the occasion, for they are well-trained pussies and seem to understand that they are part of the equipment. These kittens have a glowing reputation among the children and many of the artist's pictures show happy children hugging kittens or sometimes pulling their tails.

The first thing that impresses you as you meet this photographer is her warm personality. Her southern temperament bubbles out in good fellowship and hos-

pitable cheer. You are at ease at once in her presence and she keeps you this way until you clasp her hand at the door in parting. She has special interest in the younger set and almost daily is giving advice and training the eye or the hand of the school girl or boy to interpret the art of photography. They all go to the Greene studio when "something" goes wrong with the camera. She has a deep interest in the art work in her community and is a member of one or two clubs that further it. She commands a host of friends and they are truly proud of her in her profession, for she has achieved much success without the easier surroundings and wide opportunities afforded other women who are doing the same line of work. She is self-made in



BY M. L. GREENE, MORRISTOWN, N. J.

her profession and her work is conceded to be by many well-known photographic critics marked because of its originality of pose, animation in facial expression and quality in tones.

This artist has no rule for taking pictures. Every subject is a different study to her and she fashions her work to meet



BY M. L. GREENE, MORRISTOWN, N. J.

the natural bearings, individual characteristics and personal temperament of the subject. Often she breaks the rules of the profession which alone affords the art in her unhampered development and the result is a new creation.

Mrs. Greene believes that in photography, as in art, there is no limit to the work which may come out of it, and says "that in striving to reproduce the real likeness of the person, the thought is to catch the face at the moment when the soul reveals the true beauty of the character and the spirit which pervades and lights the whole being." In photography as in every other profession the women have had the hardest conditions to struggle against and the least encouragement from the profession generally. They have won out through their energetic efforts and artistic ideas. The technic is one thing to master, but true love of the beauty in art and the ability to express it through that technic which is the keynote of woman's success in this field. The finer nature, the love of the spiritual and keen insight have brought women their reward, for they perceive and understand and sympathize and love. These virtues are characteristic only of the true woman and they can and will win laurels for her when other things fail. Applied to photography these qualities bring out the hidden beauties in each

subject, and working in their own way women have revealed many wonderful things in the work that has created a new era in this art. We see pictures today that seemed impossible with the camera a few years ago. Mechanical devices and scientific discoveries have helped to bring this about, but back of it all are the earnest efforts and the persistency of the true lovers in the profession who consider the artistic side of their work and confine their first thought to it. Woman's influence has raised the art to a higher and finer degree, which is felt not entirely among the workers in the field, but throughout the minds of many others who are hungry and anxious for a glimpse of the deeper things of life that have come to us through the finer arts. The brightness and joy of an appointed work is one of the greatest gifts life has to offer, and photography is so linked with other interests and so closely woven with our everyday surroundings, that each one of us is privileged to come in contact with it from time to time and take advantage of its many opportunities. Women photographers hold a place of ever-growing importance in the world today and it may be carried by them beyond our greatest expectations, for through growth we learn that "to larger sight, the rim of shadow is the line of light."

ON LIGHT EFFECTS¹

By SADIKICHI HARTMANN

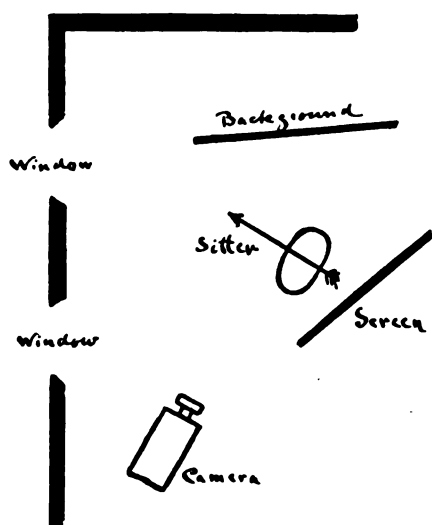
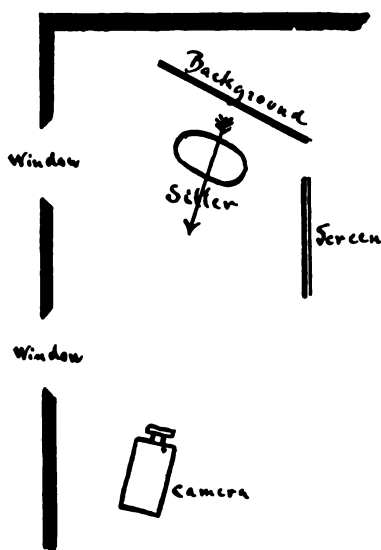
(SIDNEY ALLAN)

IN photographic portraiture the simple light effects are the best. It is a different matter if you are engaged at a figure composition, then you may indulge freely in all kinds of light experiments.

But in a photographic portrait the light effect should be soft and pleasing and in no way obtrusive. I suppose every photographer has his own system of lighting and his own ideas about the exact angle of the skylight, about the relative positions of the sitter and the

raphers know these things much better than I. All I wish to show is the guiding principle that somehow should control all efforts and results.

It is my contention that the most natural light effect would be also the most effective one for portraiture. An English photographer (I have forgotten his name) is responsible for the accompanying diagrams; he claims that they present the simplest arrangement of pictures with the most natural result. I cut them out of some foreign magazine

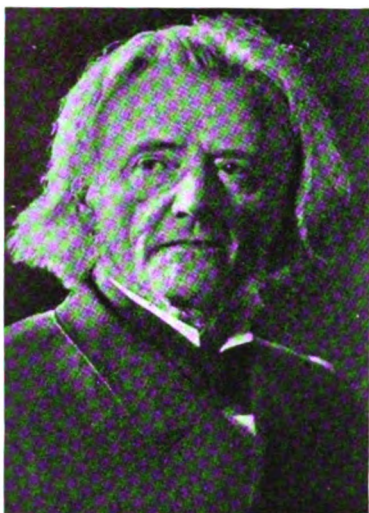


camera, and the management of screens and other studio fixtures. And the more practical and precise his system has become in the run of years, the simpler it will be. For a system of lighting is nothing but the simplification of light conditions for practical purposes. I, therefore, do not intend to talk about frontal, side, and marginal lighting, nor about Rembrandt, shadow, and line lighting, or any other method of lighting, being of the opinion that the photog-

eight or ten years ago. Study them, and you will see that they still tell their lesson today.

If it be possible to come down to one kind of light and to pronounce it as the most serviceable and natural one, it is that of the diagrams. It shows the face as the majority of Old Masters have shown it, with the strongest high-lights on the forehead and nose, and a few less vigorous on the cheek bones, upper eyelids, around the mouth and chin. The light effect of Van Dyck's "Rubens" (Fig. 1) is typical for old-time por-

¹ From "Composition in Portraiture."



9. BY DÜHRKOOP
10. BY R. CRAIGIE

11. BY FRANZ GRAINER
12. BY ERWIN RAUPP

traiture, and cannot be surpassed for clearness, for forceful simplicity, and effective modelling. Its laws have been closely followed by all good portrait painters. The face should present the largest lighted plane in a portrait. Only then preciseness of features and plastic results, after all the most desirable qualities in a likeness, will become possible.

The modern tonalist has overstepped this convention. Weary of the everlasting repetition, he has introduced all

sorts of innovations. He is fond of working in middle tints without strong contrasts. Look, for instance, at Craigie's portrait of an old lady (Fig. 10). Do you really consider that method of flattening and subtle gradations superior to that applied in Fig. 12? Of course it is largely a matter of taste. I am convinced, however, that a likeness is easier to obtain in the straightforward lighting of Fig. 12 than the blurred effect of Fig. 10 or 4.



1. BY VAN DYCK
2. BY H. KÜHN

3. BY RAEURN
4. BY W. LOCKWOOD

Figs. 2 and 3 are treated in the Van Dyck manner. They show the difference between a photographic and a painted portrait. It seems to be impossible in a photograph to get the shadow as precise and at the same time as translucent as in the Raeburn portrait. The photographer is obliged to work in broken tints and subtler monochrome gradations.

There has been a tendency among modern painters to reduce the proportion of lighted planes to their minimum. The ratio of space devoted to lighted planes has steadily grown smaller. The Italian masters give to the lighted sections about $\frac{1}{3}$ of their canvases, Rembrandt reduced it to $\frac{1}{8}$, the English

portraitists allowed still less, and Whistler in some of his portraits, for instance, his "Sarassate," used only $\frac{1}{16}$ of the canvases for his light arrangements. "The Violinist," by Wilton Lockwood (Fig. 4), is a good example of this style. This elimination of light is sure to produce a tonal effect. The darker masses concentrate the eyes upon the lighter part of the picture, and the more delicately the light arrangement will lead the eyes from one point of interest to the other one the more harmonious and beautiful will be the pictorial effect. But this style does not permit strong contrasts; the face cannot be portrayed with normal clearness. You will notice that the collar and the



5. BY C. RUF
6. BY B. WIEHR

7. BY C. RUF
8. BY DÜHRKOOP

rim of the violin carry the strongest high-lights. The face is really entitled to them. The larger the range of light and shade is, the more accurate in expression, in construction, and modelling the face will become. The strongest high-lights on accessories always sacrifice something of the likeness to a pictorial effect.

The photographers to a large extent have followed in the footsteps of the painters. The Secessionists and extremists in this respect are strictly imitative.

The source of light applied in photographic portraiture has become smaller and smaller in recent years. And the result is the same as in painting. Portrait photography has become more pictorial, but less clear and precise in expression.

In Figs. 5, 6, 7, and 8 we will notice a number of curious, out-of-the-ordinary light effects. They are interesting and show clever manipulation, but they will never do for portraiture. To concentrate the light merely on the forehead (Fig. 5),

on the upper part of the face (Fig. 7), on one cheek (Fig. 6), or on a part of the face (Fig. 8) is in no way conducive to the producing of a likeness. People will wonder why the light strikes the face in such a peculiar fashion. They will find it odd and eccentric, but I fail to see that anything is gained thereby either for the photographer or sitter. The source of light should explain itself, or rather strike the face so naturally that no explanation is necessary. If in Fig. 8 the peculiar light effect were produced by a broad-brimmed hat, there would be no objection, but as it is the effect is meaningless. Nor is it particularly beautiful, which would be an excuse.

Fig. 9 is an excellent tonal composition. The face is kept entirely in middle tints. But everything essential has been preserved. There is characteristic expression, good modelling, and even preciseness in the shadows without the usual opaqueness.

Fig. 12 is a good example of a portrait in a lighter key. A stronger accentuation of high-lights would not have harmed the picture, but even as it is it is clear and light and expressive, as a portrait should be. The keynote of color in the human

face is light, and it should be rendered in that way. The majority of portraits today look as if the people depicted were mulattoes or quadroons, which is not particularly flattering to the sitters. Fig. 9 also shows the value of lighted planes for the expression of color.

The feeling of color in monochromes is expressed by contrast, and contrast is possible only by the juxtaposition of a variety of tints ranging from white to black, as seen in Figs. 1, 2, 3, 11, and 12.

My series of discussions on "Composition in Portraiture" have come to an end with this chapter. My readers, at least those who have remained loyal to me, have no doubt realized the object of these articles. I have tried to convey those principles that everybody engaged in the profession should know. With a little leisure to investigate and analyze, everybody will arrive at the same conclusions. They will furnish a reliable basis to work up. The remainder necessarily must be left to years of experience and experiment. Only in that fashion my readers will arrive at a mastery of composition, not merely of its fundamental principles, but all its intricate subtleties and marvellous possibilities.

GETTING YOUR STUDIO INTO THE MOVIES

By ERNEST A. DENCH

The Stock Ad Film

THE stock advertising film is popular because it is cheap. It does not look cheap, however, which is equally as important. You want a moving-picture film the length of which allows it to occupy the screen for the same duration as the slide, but no longer. From forty to sixty feet is just about right.

The moving-picture concerns that specialize in this decidedly effective form of advertising have not confined themselves to one particular kind of production. Taking their cue from the regular photo-play producers, they have aimed

at variety and novelty. The average stock film costs between four and five dollars.

One which I viewed the other day showed an ocean liner being torpedoed by a submarine, the explosion scattering the letters in all directions. They arrange themselves into the advertisement for the photographer, after which the steamer disappears beneath the surface.

The stock film certainly costs more than the stock slide, but audiences evince greater interest in the former, because it offers genuine entertainment without the advertising element forcing itself to the front.

Your Own "News" Film

The live photo-play exhibitor is deeply conscious of the fact that the national animated newspaper has its shortcomings, especially if he be located in a small town. Folks in Clayville are not so interested in Van Troppen laying a foundation stone in New York City as they are in John Brown opening the Clayville library. Maybe they saw the latter event performed, but that does not decrease their interest; rather, it increases it, since the motion-picture camera presents the event from a new viewpoint. Another thing, they are among the crowd, and who does not like seeing himself on the magic white screen?

Let us suppose, for instance, you are photographing an important local wedding. Here you have an event with a legitimate news interest. In putting over the press agency stunt, you would have the exhibitor send a motion-picture operator to cover the assignment and get your photographer recorded at work, but that would not benefit you materially. The theater man, as likely as not, would leave your studio out of his calculation, and for you to profit thereby it would be necessary to have a few feet of film showing your man leaving the studio with the necessary apparatus. So, to put this stunt over, you must defray the cost of same. Some exhibitors have their own movie cameras; others hire a local cinematographer, but the arrangements in either case practically amount to the same. Of course, if motion-picture work is a sideline with you, the problem automatically solves itself.

If Mrs. Brown, the well-known local clubwoman, sent you a testimonial in regard to the photograph you took of her baby, the first thing that would occur to you would be to have the letter flashed upon the screen. That's far too crude. But you can film an interview with your worthy client and introduce some intimate scenes, not to forget the visualized testimonial. This would produce an exquisite blend of entertainment and advertising.

The motion-picture photographer usu-

ally charges fifty cents a foot for producing films along the foregoing lines. A motion-picture film has to survive so much wear and tear at the hands of different theater operators that, in order to preserve its perfect appearance as long as possible, it should be printed upon a reliable stock. Most of the regular producers use Eastman, so it is best to specify this particular kind.

By offering the exhibitor a news-event film he will gladly snap up same as a special attraction. And such publicity as you will receive will not be forgotten in a day.

Giving Away Strips of Film

Photo-play fans have the souvenir habit badly. I have known them to write the manufacturers direct for strips of film they have seen. If the producers encouraged this practice, their profits would soon be eaten up.

The exhibitor only hires the film from the exchange and is therefore not free to do as he pleases with it. It is seldom, however, he receives a reel in perfect condition, the most common defect being cut or torn sprocket-holes. If he removes two or three imperfect "frames," of which there are sixteen to every foot of film, it does not mutilate the production. But there will not be sufficient cuts to justify a general distribution, so the next best thing to do is to have the portion turned over to you. Use it as a negative and print the desired number of copies on regular velox postcards or double-print paper, the latter being the cheapest and most effective. Next cut them up to resemble genuine strips of film. This stunt will be doubly effective if the clippings are chosen with discrimination. A piece of film, for instance, showing either Mary Pickford or Charlie Chaplin in a typical scene is a thousand times more effective than one of Miss Nameless.

It might be carried even farther. Studio scenes are quite common in the movies, and if, say, your clipping showed Lillian Walker having her photograph taken, you could enclose same in an envelope and have the following inscription printed outside:

"The enclosed piece of film is a portion of one screened at the Idle-Hour Theatre. It shows Lillian Walker having her picture taken. If Miss Walker had her home in this town, we are sure she would favor our studio with a visit."

The first thing is to persuade the exhibitor to part with these choice morsels of film, but when you promise him the advertising on the envelopes he should be satisfied.

The stunt should also be extended to the advertising films you put out from time to time.

Arousing Local Interest with a Photo-play

Today, ninety-nine out of every hundred movie fans either desire to write a photo-play or else wish to become a photo-play star. Most of the photo-play studios employ staff writers, and now that adaptations from popular stage plays and novels are all the rage, the chances of a check going to an outside writer are pretty slim. In the acting end the one obstacle is the geographical situation, for the two producing centers are Southern California and New York. There are also so many actors with stage experience seeking engagements that the novice's only chance is as an extra, but that position is a too precarious means of livelihood to be recommended.

Why not have a photo-play produced containing a story that calls for the logical introduction of your studio?

The first thing necessary is the coöperation of the local exhibitor, whom you should approach with a mutual proposition; offer, say, twenty-five dollars for the best photo-play, comedy or dramatic, written by a local resident; for judges appoint the director, exhibitor, and newspaper editor; have the contest open at least a month in order to allow sufficient time to circularize the neighborhood; advertise outside your studio; mention the contest in your newspaper

advertising; secure liberal writeups in the local newspaper; see also that the exhibitor announces the conditions governing the contest at every performance.

After the scenario has been selected, strike your second bombshell—a voting contest for the selection of the most beautiful young woman and young man, respectively. Have each nomination accompanied by a photograph, which must be the work of your studio, together with a letter describing the competitors. Allow the judges to weed out the hopeless competitors, the pictures of the good-looking ones being published in the newspapers, besides arranging for same to be thrown upon the screen. Interest may be maintained by daily announcing the standing of the candidates. Have spectators vote for their favorites, who, if successful, will appear in the prize-winning story. Each vote should be made upon a coupon, presented with every purchase at your studio. Apart from getting your studio on the lips of everybody, each candidate will enlist the aid of friends to secure votes, thereby inducing many folks to patronize your studio for the first time.

Now comes the exhibitor's turn to reap the benefit. Your photo-play is ready for public exhibition. The town can hardly control its suspense. Then the exhibitor announces that the long-awaited local production will be shown for one week. He does capacity business, and your studio is again in the limelight. And the best part about it is that you do not pay the exhibitor for screening same as you would an ordinary advertising movie.

The cost of producing a photo-play varies from \$1 to \$3 a foot, which works out from \$500 to \$1500 for a half-reel subject. Steer clear of interior scenes, as they are expensive. A photo-play may seem costly, but it is not, for it is always available and possesses exceptional business-pulling properties.

Always rinse the plate between development and fixing.

All sulphites owe their preserving properties to the sulphurous acid they contain.

Oxidized developer acts strongly as a retarder of development.

The "personal equation" is an important factor in successful negative development.



9. HEAD OF GIRL
10. ROGUERY

11. THE WINDER
12. GIRL WITH CLASPED HANDS

MASTERS IN PORTRAITURE—JEAN BAPTISTE GREUZE

JEAN BAPTISTE GREUZE achieved an immense reputation as a painter of scenes of domestic life. He worked about the same time as Gainsborough, *i. e.*, during the years 1745 to 1775, and, strange to say, had many of the same characteristics of his great English contemporary. It almost seems as if taste was never local, but always spread over all civilized lands that were in close, even if in slow, interchange.

Gainsborough, true enough, was infinitely superior in dignity of composition; but Greuze had the same suavity of line, the same fondness for flowing curves, picturesque garments, and lavish accessories. He lived much longer than the Englishman, he even survived the French Revolution, but again he could not resist the trend of his time. He forgot the style of his manhood and tried to become in his old age an historical painter like David. He did not succeed, and died in poverty, and only the work of his earlier periods is known to the present generation. Of these, his study heads enjoy the greatest reputation. They are a trifle sentimental in tendency—he tries to play too much on our emotion—but they, after all, are exquisite compositions, no matter whether we fancy that class of pictures or not.

He always tries to say a little too much, as in Figs. 2, 8, 10, and 12. But then again we owe him quite a number of charming, straightforward interpretations, as Figs. 3 and 9. The most realistic painter would be proud of painting such a head of a girl as Fig. 9. It is merely the facial expression which make it unusual, and in this peculiarity Greuze was a master. He knew that people liked pleasant, handsome faces, and so he made them—by no means such an easy task as some people think. Of course, it can be overdone, as by our fashionable illustrators. Also, he is not exempt of this criticism: Comparatively few people, educated up to modern art ideas, could live with pictures like Figs. 2, 6, 8, and 10.

But how about the "Portrait of Sophie

Arnould" (Fig. 1), and the "Portrait of a Lady" (Fig. 4)? They surely are satisfactory even from the modern view-point.

Fig. 1 is an excellent composition. It is pleasing in line, full of contrast, and picturesque throughout. The only fault I have to find with it is that it does not show enough of the figure. It looks cramped, but this is explained by the crouching attitude. If the lady were not leaning forward one of the principal charms of the picture would be absent. The facial expression alone—exquisite as it is—would not save it. It is the way the lady sits, how she holds her head and hand, which makes the picture what it is. Besides, the dark shawl and hat with the white feather furnish notes of color and contrast that lend a picturesque appearance to the entire composition. We can easily believe that this lady was the famous actress, Sophie Arnould, who played such an important part, not only on the French stage but also in history.

The least said about Fig. 2 the better, although the drapery to the right is well managed. Fig. 3 is a convincing character delineation of a child, and this is a rare accomplishment indeed. She looks natural despite her pose as a flower-girl. This is largely due to the facial expression, and the simple way in which she holds the bunch of flowers.

Greuze knew the value of attitude. He could do whatever he wished with the human form. If his taste had been less time-pleasing he would have left innumerable masterpieces. As it is, he left but a few. Two of these are Figs. 1 and 4.

The "Portrait of a Lady," Fig. 4, is exceedingly simple. The long neck, the arrangement of the hair, and the lines of the shoulders are the principal features of the composition. The face is well drawn and modelled. Few portraitists today will succeed to make such a fine portrait with such simple means. The character of the accessories has changed. That is all. Greuze needed



1. M^{LE}. SOPHIE ARNOULD
2. GIRL WITH DOVES

3. HEAD OF GIRL
4. PORTRAIT OF LADY

pigeons, bird cages, baskets filled with fruit, to convey his pictorial ideas; the modern portraitist, chairs, picture frames, and cushions. We prefer attitudes that say nothing in particular, while the French took special pleasure in expressing reverie, melancholy, ecstasy, etc.

"Madame de Porcin," Fig. 5, excepting the wreath around the dog's head, is worthy of a Sargent. As an oval composition, it furnishes evermore a valuable object-lesson. The whole bust, shoulders, and arms repeat the oval shape. The head does likewise, and so we arrive at the formula, two oval shapes of different sizes surrounded by a third larger oval always produce an

agreeable division of space and a pleasant sensation to the eye. The dark shape of the dog and the lady's coiffure balance each other perfectly. We also notice that this painter was fond of using the shadow of figures in his background. We see it in Figs. 1 and 6, besides Fig. 5.

Fig. 6 depicts a pretty face and shows the good use of a scarf. Nevertheless, the drapery effect is a trifle elaborate. The "Portrait of Mme. de Boisset," Fig. 7, on the other hand, is strangely severe for this painter of elegance and grace. It exemplifies the application of symmetrical forms in an oval. It looks too much like the ordinary miniature. I think this style of composition would



5. MME. DE PORCIN
6. GIRL WITH SCARF

7. MME. DE BOISSET
8. GIRL WITH BASKET

be better avoided. The texture of the lace collar and satin waist is beautiful, but does not condone for the lack of picturesqueness.

There is little worthy of recommendation in the "Girl with Basket," Fig. 8, and "Roguery," Fig. 10. A facial expression which delineates a distinct phase of emotion or fancy of the mind, like "roguery," no matter how slight or fleeting, lies outside the domain of portraiture. Of course, this is meant for a study head, but even in study heads vaguer expressions are more preferable. Fig. 12 is more to the point. This girl with clasped hands would even please a Herzog. It is merely a picturesque attitude with a luminous facial expression; just the theme for decorative experiments.

"The Winder," Fig. 9, is an example of Greuze's figure pieces, by which he is best known. They show considerable skill, but the time of elaborate detail and pictorial storytelling has passed, and I believe most of us (except in Milwaukee and Cleveland) prefer a simpler face. I am of the opinion that the interest in Greuze's genre pictures and sentimental fancy heads will steadily diminish, while the beauty of his simple portraits and portrait studies, like those of Sophie Arnould and Figs. 4 and 9, will become more palpable from day to day.

They can teach the modern portrait painter the importance of a pleasant facial expression and an elegant, as well as characteristic, attitude.



BY S. H. LIFSHEY, BROOKLYN, N. Y.

METHODS

If a one-solution developer is being made, the alkaline portion must be added last of all.

In warm weather a developer containing metol is liable to fog plates unless kept below 65° F.

Hydroquinone alone gives "pretty" negatives, rather than negatives of good printing quality.

To stop development without fixing, place the plate direct into citric acid, 5 grains; water, 1 ounce.

The developing power of hydroquinone falls off more rapidly in cold weather than any other developer.

In making up metol solutions, the metol must first be dissolved in water and the sulphite added afterward.

For stand development use glycin, $\frac{1}{4}$ ounce; sulphite of soda, 1 ounce; carbonate of potash, 1 ounce; water, 80 ounces.

Always rock the developing dish if pyro is the developer.



PRACTICAL PAPERS ON STUDIO WORK AND METHODS

Good Business Methods

PHOTOGRAPHY suffers from its dual nature. It is sometimes, in the minds of its practitioners, an art, and the photographer is an artist. Was not the low collar and the flowing black necktie adopted as the hallmark of the photographic artist?

Whether the photographer is an artist or not, he must all the time be a business man. It does not follow that a great artist is a great business man. The reverse is more often the case. Sir Henry Irving during the greater part of his career had a worldwide popularity, which gave him unusual opportunities to amass wealth, yet died a comparatively poor man. His artistic successes were sometimes commercial or business failures.

A photographer may make a name for himself under the skylight and still be unable to properly support his family.

In photography the business end must be developed with the artistic, and *vice versa*, and the photographer must enlarge and improve his business methods as he improves his work under the light.

Too few photographers appreciate the importance of the reception room and the receptionist. The reception room is going to impress your customer either favorably or unfavorably. Mark the new year by looking over your reception room and see if you cannot make it look brighter and more attractive. Your receptionist is not such an easy matter, but there are surely ways and means of keying up the desire to make a better business showing in 1917 than in 1916. This is a good time to make any changes and to introduce any new ideas.

Look over your sample books and portfolios and have them renewed and put in order. See if you cannot hang up a new and better set of specimens on the walls. If the frames are in need of renewing or renovating, it will be a good investment to renew or renovate.

Go through the workroom and the printing department and see whether you are keeping up with the latest in apparatus and tools. Photog-

raphy as a science is so recent that what was up to date yesterday is today obsolete. The manufacturers are always showing new apparatus that are, many of them, time and money savers. That there were no automatic printing machines when you started in business is no argument against you putting one in now. Don't be afraid of taking up a new idea. An inventor, seeking to enrich himself, can only do so by inventing something of real merit. The discoverer of Velox enriched photography as well as his bank account.

While always striving to make better pictures, don't for a moment relax on the selling end. It is the vital part of your business.

The Showcase

THE showcase represents the beginning and the end of the photographer's efforts—the beginning, because he depends upon it to interest the people passing by his door, who have no other motive to move them in his direction than the effect it may have upon them, first, by attracting, and then by holding their attention.

It represents the finality of his attainments, because his finished work is necessary before a showcase can be arranged at all, and because the ideal showcase should contain only the best and most perfect specimens of his art that he is capable of producing, which should be culled from the work of months. It may readily be seen then, if this view of the subject is accepted, how important a matter it is that the showcase should be studied from every possible point of view, and arranged with the most consummate care and skill.

There are, it may be said, two widely different classes of studios to be considered under this heading, which are capable of treatment by themselves, namely, the large city studio, where the range of specimen pictures is wide, and includes, among other advantages, a wealth of rich costing, beautiful accessories, and charming models, and the less pretentious country gallery, or the studios located in the larger towns and smaller cities. It is not the

purpose of this article to treat of the former class, but to consider more especially the case of the smaller studio, with a view to offering a few suggestions that may be of benefit in making the showcase do more than it does in attracting business—new business, too, it should be in most cases—to the reception room.

In the first place, the size and the style of the showcase cannot be made to conform to any hard-and-fast rule. Every one should be placed in as prominent a position as possible, and as near the height of the eye as may be. Its size and shape must conform to its surroundings, and the necessities that govern each individual studio. It should be a matter of religious observance, however, that the woodwork is kept well painted, the glass immaculately clean, and the shelves and contents perfectly free from dust. All these things are easily possible of accomplishment by anyone, and it is almost a foregone conclusion that when any of these details are omitted, and any symptom of slackness is allowed to make itself seen in the showcase, it is a sure indication that the general character of the work, for which the showcase stands, is no better than the symptoms would indicate. There is another point connected with the location of the showcase which the writer has not seen mentioned, but which it seems should be of advantage, namely, that in many places it will be easily possible to have a supplementary showcase located in some store or office frequented by the public, and situated at some distance from the studio. In this case, however, a sign more prominent than that used on the imprint of the card mounts alone should form an important part of the exhibit. Having now seen to it that the case itself is well painted and cleaned, the next thought should be for its contents, and for this the greatest care should be used in the selection of its subjects, aiming rather at quality than quantity, but covering as large a field as possible from time to time. This may be done in either of two ways, as, for instance, the display of a certain week toward the end of a school or college term might be kept almost wholly on the line of graduating classes. This, in the case of a man's college, would need something in the way of special attractions to break up its monotony, although in the case of a girl's school a very attractive display could be made all along the same line. Another week, at the beginning of the holiday season or Easter time, might be devoted to pictures of the children—the brightest and cutest collection of the whole year—and other special occasions treated in the same way. Or the case may be supplied during the major portion of the year with a collection covering a wider range of subjects, as, for instance, one or two children's pictures, a few of the brightest and most charming young ladies' pictures, the matron and the elderly person, all of which should be chosen with reference to their standing and position in the community in any cases where these qualifications may be added to thoroughly good technical workmanship. Another plan that works admirably upon occasions is to make several prints from the same negative, using two or three different methods of printing or kinds of paper, in accord-

ance with the facilities of each individual studio, toning them in different colors, trimming differently, some with wide and some with narrow margins around the figure, and mounting them on cards of various shapes, kinds, sizes, and colors. An exhibit of this nature will probably astonish the man who makes it as much as it should interest those who see it.

The case should not by any means be overcrowded, and where it is, as frequently happens, a part of the entrance of the studio, occupying the whole or part of the side wall, it should be covered in by glass, and either be painted or hung with cloth or burlap of a color to harmonize with the surrounding decorations. The prints to be displayed should be mounted upon wide-margined cards and grouped somewhat irregularly, leaving plenty of space between each and its neighbor, so that no idea may be suggested of their having been huddled together in a hurry.

As a closing maxim, let the showcase tell the story of thrift and good taste, then let the work of the studio verify this story.

On Displays

THE quality and the amount of your show or exhibition work depends as much on your own individual taste, attainments, and power as upon your environment and upon your clientele, by which I mean, of course, your customers or patrons. The refined or esthetic show work would be as out of place in a border town as would the painfully crude and literal display of the latter on Fifth Avenue. The mere transposition I have here suggested conveys an object lesson which does not need many more words in exemplification. To secure the appreciation of the refined, the amount of your display cuts no figure. Indeed, if overdone in this respect, it is apt to be a handicap. A pearl or diamond will draw the eye anywhere, but you will agree that neither will shine particularly if thrown in among a lot of imitations.

The crude show of your humble border-town competitor shines by contrast with the tintype of the travelling studio wagon, and is entitled to its meed of praise on account of its isolated location and its obvious limitations.

It is vastly different with those living in closer touch with the advanced taste of the day. The matter of a suitable display of work for exhibition purposes requires no little consideration or taste, and considerable expense if we desire to present our very best. Very few studios are fortunate enough to have a reserve fund of desirable work from which to evolve a suitable and thoroughly satisfactory exhibit. Pictures on hand are usually culls, which, though often used in desperation for lack of better material, should not be used if by so doing you prejudice the really good ones in the balance of the exhibit.

Cabinets, half-cabinets, and cards, as well as the lesser ovals, have been styled "chicken feed," and when they are *alone* the prevailing sizes in a studio and they do not contribute materially to a very profitable income, why not conceive or plan your show work in a class or size that you are desirous of putting out? In the first place, such

work would be vastly more creditable to the studio, as well as much more remunerative; hence it is imperative to *have* and *push* such a class. "But," you may ask, "how am I to use such work when 90 per cent. of my trade calls for cabinet and under?" The matter is comparatively easy, and there are several ways to accomplish it. In an earlier paper I have briefly sketched the means by which the cabinet photo was introduced; the sizes and styles must first be made and then shown, and if you have done your part well, not much urging will be necessary to make them go. If you do not care to wait until you have a sitter with the desirable characteristics, you may cast about you and go on a "still hunt" for some such, and when found invite them, making, of course, the proper suggestions as to wearing apparel, etc. You can then go ahead and do your prettiest, both as to pose and lighting, always bearing in mind the effect you are striving for in the general display. I much prefer, however, to make the selections from salient sitters among my regular patrons. I know of many studios where it is the rule instead of the exception to make the larger negatives as well as the size requested; it will always be found profitable to do this when likely sitters appear, for the added expense is not much, and the result will, nine times out of ten, justify the extra trouble. It is the constant, ceaseless, ever-striving to surpass your best work that will land you at the goal of success, no matter what you undertake. Our business or profession does not differ in that from others, and the methods must often be compared, weighed, and applied.

Now, a few words about the display in general: "Concentration," says a humorist, "is better than scatteration," and so will say all the thoughtful ones. This holds true, whether we are dealing with an outside doorway or gallery entrance show, a show upon the studio walls or at a convention. Not only do these remarks apply to the whole exhibit, but to the individual parts as well.

Do not design a display that is "spotty," which you are liable to do by an unfortunate arrangement of sizes, large and small, improperly composed; or by injudiciously grouping pictures that agree well in form but do not harmonize in depth of tone. An agreeable effect should be apparent to the eye of the beholder even when he is so far distant from the grouped exhibit as not to be able to distinguish the individual pictures; this is a very severe test for composition, but such composition is essential if it is desired to make an effective arrangement, as well as one in which the individual pictures may be closely scrutinized for excellence. If the arrangement is framed either as an upright or horizontal oblong, the form can be carried out in the inner grouping, as many smaller oblongs carefully arranged will form a larger one, and while the effect is a little severe, it is better to use that principle than to break the arrangement abruptly by the unfortunate introduction of a larger form of subject, unless it be, perhaps, a proportionate oblong, which, though larger, will permit its introduction, and thus mosaic in pleasantly. A few general rules can be laid down. It is safe to "mass" the different sizes each by themselves, be they large or small; in this way, if you combine them

properly, they will form a harmonious part of the whole. Most of these remarks are governed by the law of harmony rather than by the law of contrast; if you adopt the latter, execute your grouping with knowledge and judgment, always bearing in mind that the sizes must be then combined according to the humorist's law of "scatteration." I am here confronted with the extreme difficulty of illustrating pictorially the ideas I have been trying to set before you; as a matter of fact, to properly illustrate the subject, exhibition groups would have to be made up and reproduced in half-tone, but it is not possible here where I write to find a selection of subjects suitable and pertinent to the subject under consideration. However, if you have saved the back numbers of your photographic journals which treat of conventions and the various exhibits, you will surely see many which can be taken as model exhibits, though none are to be copied literally.

This would not be possible; for, in imitating closely another person's idea of grouping and arrangement, you might not be able to complete it by relevant photographic work; hence you might carry out the letter and entirely miss the spirit. I am inclined to think that all the masters of today do not attach the importance it deserves to a perfectly proper exhibit of their show work, apparently leaving it more to chance and fortuitous accident than to careful consideration of the exacting conditions.

The exhibit for the walls of the reception room needs much care and thought in selection and location. Here, if it is large, the amount of your show is apt to be a handicap as well as at your studio door, and perhaps more so. See that your walls have proper tone or tint; gilt frames add a richness that other kinds do not, and will fit and embellish most any picture. For colored work, it is almost imperative that gold be chosen. It is hardly necessary for me to enumerate the tones that are harmonious for frames as well as for pictures contained therein. Do not overload your photos with too massive frames, nor have the frames too near alike in size or style. Locate the principal pictures of the intended group centrally, and as a foil add only such frames as will not detract from the main one either by reason of size or form. Keep the group of frames well together and leave plenty of wall space for breadth and neutralizing effect. If there is one thing that can be said, and that will apply to nearly all (I do not say all), it is that *too many* pictures are hung or displayed in studios generally. If there is something more that applies to a good many exhibits, it is that the same pictures are permitted to hang too long without changing. Do you wonder that I started in by saying that a proper show is a matter of expense? I should have said *great* expense at that.

An Unfailing Source of Income

WHEN business is quiet the photographer will sit around and think up a hundred and one reasons for the falling off in receipts. The weather is either too hot or too cold or it rains or snows. The crops have failed and there is no money for luxuries, or they are too good and there is no

time for pictures. But of the many and varied reasons for a slack season we never heard it put forward that the children were not as numerous as ever.

How few photographers realize the possibilities of the never-failing supply of children of all ages and sizes, from the chubby infant to the dainty miss just coming out in long dresses. All of them possibilities of beautiful pictures. Each and every one of them the pride and glory of their proud parents.

Every baby picture in your showcase is a direct challenge to every mother of an unphotographed baby. Is not her pride and joy a better-looking baby than any you have pictured in your showcase? Surely! and you should not have much trouble in persuading her to let you demonstrate the fact.

Good pictures of babies are not easily made, but they are worth all the trouble you can take to get them. They are the best kind of advertising. A baby picture will attract the woman every time, and it's the woman who has the money to spend on photographs. The man is usually too busy getting the money to pay the butcher, the baker, and the coal man, to think about the photographer.

There are the seven ages of children, just as of man, and you ought to get them in all the different stages of growing up. If properly trained, many parents can be persuaded to have a picture made on each succeeding birthday. The desirability of this annual record has never been sufficiently emphasized by the photographer. Your desk "tickler" or reminder should automatically advise you a few days ahead that one year ago Baby Brown had his picture made. Many parents would respond to a well-worded invitation to come and have baby's growth in size and increased beauty recorded.

Another advantage about photographing the baby is that he never comes to the studio alone. He is always fairly well attended by several members of the family, offering further opportunities for more business.

The enlarged picture offers an opportunity that is too often neglected. A particularly happy baby pose or expression will often make a charming picture when enlarged. To refer to Fifth Avenue, one of the most attractive pictures on the avenue at present is a delightful picture of a baby boy almost life size, sucking his thumb in a most natural and winsome manner.

Cultivate the baby, there are plenty of them, and the supply is unfailing.

The One-man Studio

POSSIBLY there was a time in the past when the one-man studio could be made successful. We believe now that every studio, no matter how small the city in which it is located, can do more business and make more profit for the proprietor if some assistance is secured.

It is different now from what it was a few years ago. If you are located in a small city and have done all your work alone in the past, you

need assistance of some kind now, for you are sure to have developing and printing for the amateurs and should sell films and kodaks to your customers.

The proprietor of a studio, no matter how small, cannot afford to spend his time developing films or making amateur prints. It is better for him to devote this time to advertising ideas, changing his showcase, putting new samples in his reception room, and other work which will bring him greater returns.

Then again, the proprietor of any studio should be free at all times to wait upon customers when they come in. If he is doing amateur printing and developing and they must wait, it is his loss every time. A young man or a young lady can be secured, usually at a moderate price, for this class of work. They are also very useful in the reception rooms on days when there is a rush of trade.

The finest pictures and those who win "Salon" honors and first prize, are not the result of one man's work. They come from studios where the negative is made by one person, retouched by another, printed by another, and oftentimes mounted and finished by a fourth person.

Then again, there is much home portrait work at this season of the year and view and exterior work during the summer season, and no studio should be closed at any time. When you must leave your studio for this class of work, a young lady in the reception room can take care of customers, entertain them if necessary until you return, or make dates for a sitting.

The increased business which you will get will more than pay the salary of the person hired. Possibly some people get used to it, but ninety-nine out of a hundred are annoyed when they open the door of a studio and hear a bell ring somewhere off in the distance and stand looking awkwardly around for some one to appear. This is a bad impression to start with and must be overcome before a good order can be taken.

If you think you are making money by trying to do all your work alone, you are mistaken—you are losing money. You cannot afford to do work which can be done by some one else just as well as you can do it, and at a small salary.—*Ohio Photo News.*

Push Enlargements

THERE'S a lot of business to be done in enlargements. Are you getting hold of it? Every amateur in your district has dozens of negatives that will make excellent enlargements. You should have specimens of your work on view.

When a customer brings spools to be developed and printed, it is a good plan to pick out a few of his best negatives and tell him that they are just right for enlarging, and at the same time show him a specimen enlarged from a negative the same size as his own.

There's plenty of enlarging to be done, and it only means stirring things up a bit to bring it your way. And don't forget: enlarging carries a good profit.—*Kodak Trade Circular.*



Report of Executive Committee of the National

THE meeting of the Committee was held at the Hotel Wisconsin, Milwaukee, January 22, 23, 24, 25, 1917, all members of the board being present. Plans were discussed not only for the convention itself, but for the Association work during the entire year.

September 3 to 8 were selected as the dates for the coming convention. The auditorium, which is one of the finest convention halls in America, was selected for the meetings and exhibits. A large arena with over 22,000 square feet of space will be used for the exhibits of the manufacturers and dealers. Several meeting-rooms with capacity of 500 to 1200 people will be used for demonstrations, meetings and the picture exhibit. All space necessary for the requirements of the convention will be found on one floor of this great auditorium.

The Hotel Wisconsin, a new fire-proof and modern hotel, was named as the headquarters. It is located within five blocks of the auditorium. It has 500 rooms and is so situated that those who will not be able to secure accommodations at the headquarters will find several good hotels within easy reach.

A program is prepared with the idea of covering every phase of the photographer's work. No one department will be featured at the expense of other departments. There will be practical demonstrations in negative making by several of the leading pictorialists of America, as well as by those who are making a success of the photographic business through photographs that appeal to the average public.

Complete and continuous demonstrations will be given in the use of air-brush, working in back-grounds on negatives and prints. At the same time demonstrations of etching and retouching will be given.

Lectures on the business side of the studio will be given—on advertising, salesmanship, service and reaching the rural trade. In addition, the active members of the Association will be given an opportunity at one of the meetings of the convention to express their views in regard to the extension of the service of the Association for the elevation of photography and for the enlarging of the membership.

Market Prices

THE market prices of photographic materials are still fluctuating, and about the only difference between conditions that prevailed a year ago and those prevailing at present are that instead of advances all along the line, there are some reductions recorded. Cardboards are going up. Chemicals are going down. Manufactured articles of wood and metal are showing irregular advances, while the staples in the business as yet remain stationary. We might as well give the bad news first and get it over with. The card and paper market shows an advance of 25 to 30 per cent. The new prices go into effect without notice. The possibility of such an advance has been known for a year, but the longer it was delayed the higher were our hopes that the crisis might be passed without a radical change in price becoming necessary. There had been threats of advances, but as time passed and they did not materialize, we had come to believe that if there was an advance it would be comparatively small, and probably not more than 10 per cent. However, the second week of the new year was ushered in by announcements from all the card manufacturers, stating present market prices of cards and folders, same to go into effect without notice. In going over the new prices, it is found that the most startling advances are shown in the low-priced mounts, and particularly in the heavy boards for solid mounting. For instance, 8 x 10 black or gray cardboard that used to sell for \$1.00 a hundred, is now quoted at \$1.85 per hundred by one manufacturer and \$2.00 per hundred by another. The same proportion of advance holds true in other sizes. View mounts show advances that are equally as startling. For instance, the Federal view mount was formerly sold at \$1.85 a hundred for the size B, and later for \$2.00 per hundred, and is now \$3.25 per hundred. The C, for 6½ x 8½, is now \$5.25, and the D, for 8 x 10, \$6.50. The Meadowbrook, another popular view mount, which formerly sold at \$1.90, is now \$2.75 per hundred for the B and \$4.75 for the C and \$5.75 for the D. The Hudson, which was formerly \$2.25 for the 5 x 7, is now \$3.50. These advances are quite startling, and we confess were much greater than we anticipated. Solid mounts in

6 x 9 and 7 x 11 have advanced materially, but not quite so much as the view mounts. For instance, Roberta, F-L, which formerly sold at \$1.80 per hundred, are now \$2.45 per hundred. Mezzo, which formerly sold at \$2.80, is now \$3.25. These quotations reflect the proportion of advance generally through the better grades of stiff mountings.

The higher price folders, which are made mostly of cover stock and bristols, show advances averaging from 10 to 15 per cent. For instance, the 7 x 11 Alvin, which formerly sold for \$6.00 per hundred, is now \$6.50. The Angora, which formerly sold at \$6.25, is now \$6.75. These advances do not hurt nearly so much as the cheaper grades, and the percentage of increase is not nearly so high. Some of the cheaper grades of folders, such as postcard folders, show a rather higher percentage of increase. For instance, Koneyile used to sell for \$2.25 a hundred, and it is now \$2.80. The Hub folder used to sell for \$2.25, and it is now \$2.75. From information that we have obtained from the manufacturers, it seems that if the price of photographic mountings had been based strictly upon the raw material costs, these advances would have been more gradual. It seems that the manufacturers had bought heavily of raw stock, and as the paper market advanced, they did not change their prices, but continued to give the photographer the benefit of their heavy purchases at lower prices. As their stocks became exhausted, they realized that they would have to go into the market and buy the raw stock at prevailing prices, which, by this time, had advanced so much over the prices in effect six months ago that the unusual advance just announced was necessary. While some may be inclined to object to so heavy an advance coming so suddenly, it is well to consider that the manufacturers have rendered the public a distinct service in maintaining prices at the former levels as long as they did.

There is another aspect of the present situation which demands careful consideration, and that is the prospect of losses when the period of advancing prices is over and lower prices are in effect. Every manufacturer and dealer is compelled to buy large stocks in advance in order to supply his trade. While his purchases may increase or decrease, according to the prospects, under any circumstances he has invested a large amount of money, even at the minimum. If he does not take advantage of some of the profits that he is entitled to on the advancing market, he will be compelled to take his losses whether or no on the falling market. He has to dispose of the stock he has on hand, and is compelled to sell at prevailing prices, and it is obvious that, as the selling price on a falling market is less than the original cost for raw materials and the cost of labor, he is losing money very rapidly. Unless he was able to make a little extra profit on the rise, he will be unable to stand his losses on the drop, and, as everyone knows, these losses are inevitable.

Among the manufactured articles, there are numerous price changes, none of which, however, are of startling importance. The Halldorson flash machine has advanced from \$30.00 to \$35.00. The Northern Light has advanced from \$60.00

to \$65.00. As the new price lists for the spring and summer are not out yet, we are not familiar with the exact future prices of a great many articles used by the photographer, and so are unable to give figures, but we have information to the effect that there will be quite a number of small advances in the line of photographic apparatus and accessories.

The developing chemicals are coming down, praise be to Allah! Kodolon is now 65 cents per ounce, which price compares favorably with the price of developers before the war. Hydrochinon is now \$2.50 per pound, which compares favorably with \$6.50 a few months ago. Other American-made developers range in price from 85 cents to \$1.00, and at these prices with the economies in vogue that the war has forced upon photographers, developing preparations are now cheaper than before the war. Pyro still is strong, with chances favoring a stable market so long as ships are scarce on the ocean and freight rates are high, for all of the raw material from which pyro is made comes from India and the South Seas. Potassiums are very nearly down to normal, and taking the chemical situation throughout we would say that present price conditions are most gratifying.

As to the best methods of handling the situation, the photographer is compelled to work out his own problem. In our judgment, little would be gained by buying heavily of chemicals or such articles as are liable to drop further. Card stock at present levels can be bought without apprehension, for everything indicates that there is little chance of a violent drop for several months. However, we do not believe that heavy purchase would be wise, for it is within the scope of possibility that some unlooked-for crisis may arise which would send prices crashing in all directions. We repeat, however, that such a crisis would be unlooked for, and in our judgment it is improbable, yet highly possible. In plates and papers we have no information indicating that there is any prospect for change in prices, either up or down, and these articles are of a perishable nature, so very little can be gained in trying to load up against an advance. It is a period that demands shrewd observation and careful action for any merchant who is trying to make money while the making is good, and to keep from losing money when losses are the general rule.

This great war,
The strife, the stress
Have made our prices
More than less.
'Tis not our fault,
It has to be,
The fault lies way across the sea.
—*Taprell, Loomis & Co. Announcement.*

Fotocraft Changes Name

THE name of Fotocraft, under which so much has been accomplished during the past five years for the advancement of art in Bangor, Maine, was changed, and hereafter will be known as the Bangor Society of Art. This has been done, after mature deliberation, in the belief that under this name more liberal policies may be adopted and carried out, which shall prove

to be of greater benefit to the community, and it is earnestly hoped it will receive the hearty support of every one interested in promoting the love of art in all its branches.

Kodak Advertising Contest Results

THREE thousand dollars has been distributed in ten cash prizes to the winners of the 1916 Kodak advertising competition.

Competition was keen and the work of the judges was made all the more difficult by the great number of really good pictures entered.

The decisions were often close, but the judges made their selections in a fair-minded way. They were guided in their decisions entirely by the merits of the pictures—their suitability for advertising purposes.

The pictures entered in the 1916 contest have been especially interesting because they showed remarkable originality—a great diversity of ideas with selling points—pictures that told a story, and many of them that told their story exceptionally well.

The use of photographs as illustrations in advertising is growing rapidly. Not alone in the national magazines, but in special advertising and catalogs, photographs are being used in greater numbers to show the uses and advantages of the goods advertised and especially to show the pleasure or satisfaction derived from their use.

Such pictures, of real people, doing something real, have human interest. They make other people want to do likewise, and so create a desire for the things about which they tell their story.

Our advertising contests furnish us material for advertising illustrations—our illustrations interest other manufacturers in the use of photographs for advertising, and the experience of those who have competed for our prizes has taught them much about the requirements of the man who has something to sell and wants a picture to help him sell it.

There is a great field for the photographer who has ideas and knows how to express them in pictures, for such pictures are worth money to any advertiser.

The judges of the 1916 contest were Mr. Ryland W. Phillips, President, Photographers' Association of America, Philadelphia, Pa.; Mr. E. B. Core, Yonkers, N. Y.; Mr. Condi Nast, publisher of *Vogue*, New York City; Mr. Edward Hungerford, Advertising Manager, Wells Fargo Express, New York; and Mr. W. R. Hine, Vice-President and General Manager, Frank Seaman, Inc., New York City.

The prizes were awarded as follows:

First prize—W. B. Stage, New York.

Second prize—Chas. Luedecke, West Philadelphia, Pa.

Third prize—Karl Struss, New York.

Fourth prize—Chas. E. Mace, Estes Park, Col.

Fifth prize—A. Van, Toronto, Canada.

Sixth prize—J. B. Hostetler, Davenport, Ia.

Seventh prize—Harry Steffens, Cleveland, O.

Eighth prize—Wm. S. Ellis, Philadelphia, Pa.

Ninth prize—Wm. C. Motteram, Philadelphia, Pa.

Tenth prize—Fashion Camera Studio, New York.—*Studio Light*.

Courage

He who lacks courage has no place in business. Spend money for advertising.

Improve and beautify your reception room.

Stick four-square to list price.

Promise and deliver the best kind of service.

Borrow from the bank when necessary.

Play fair with competitors.

Be patient with obstreperous customers.

Go after business in a way to make everybody take notice.

Be steadfastly loyal.

These are but a few. You yourself can think of many more. Courage lies in your will. Master your will and you have won half the battle for success.—*The Jeffery Circle*.

"Chemistry for Photographers"

BY WILLIAM RUTHVEN FLINT, PH.D.

Cloth, price \$2.00, net.

THIS is a book that has been much needed by photographers. The purpose is two-fold. First, the chemical principles whose application forms the foundation of photography are set forth in a manner both intelligible and interesting. In order to fix these principles in the reader's mind and to aid him in the acquisition of a better chemical technique, the subject matter has been so arranged as to permit the introduction of a series of illustrative experiments.

Second, without in any way interfering with the foregoing intent, it has been possible to add very materially to the practical value of the book by incorporating much useful chemical and photographic information in the way of solubilities, formulas, etc. This information has been so simplified and tabulated as to make it exceptionally convenient for reference purposes.

Supplied through this office.

Toronto Camera Club

FOURTEENTH Salon—twenty-sixth annual exhibition—to be held May 2 to May 16 inclusive, 1917, in the Art Museum of Toronto, No. 26 Grange Road, Toronto, Canada.

The annual exhibition is intended to bring together a thoroughly representative collection of all that is best in pictorial photography, and the committee hopes that this prospectus will be accepted as a cordial invitation to submit new and distinctive work. The exhibition is international in character, and is open to members and non-members alike without distinction. The committee welcomes the friendly coöperation of photographers at home and abroad in its efforts to make the forthcoming exhibition a worthy successor to those which have preceded it and a true reflection of the present position of pictorial photography.

Mr. Herford T. Cowling Accepts Position with Burton Holmes

MR. HERFORD T. COWLING, who for several years has been employed in making motion and still pictures for the U. S. Government, has resigned to accept a position with Mr. Burton

Holmes. After spending the month of February filming the Canadian winter sports they will start on a seven months' trip to the Orient and the South Sea Islands. The trip will include Hawaii, the Philippines, China, Japan, Australia, New Zealand, and other interesting and out-of-the-way places. They expect to secure motion pictures of the only existing cannibal tribes, but have not yet announced whether they will carry the banquet with them.

Mr. Cowling's beautiful and unique films of Government activities and little-known western scenery have been largely instrumental in the recent awakening to the educational value of the motion picture and the resulting Federal appropriations for such work.

Mr. Cowling was obliged to cancel a number of local engagements in order to join Mr. Holmes on February 1, among others being one to address the Federal Photographic Society, of which he is the president, on the cinematographic art.

"Rexo" Products

"EVERY click a picture" is the new slogan Burke and James, Inc., of Chicago, have taken for the Rexo Cameras, film and paper.



The Rexo film, which they are now in a position to supply the market, is a high-grade product. The negatives, we find, are remarkable for their brilliance and excellent printing qualities, the emulsion very rich in silver, insuring fewer failures. They are also orthochromatic. A trial would be well worth while.

The new Rexo booklet is ready, and can be had of your dealer, or direct from the manufacturers of Rexo products.

A Beautiful Catalogue of an Important Exhibit

THE catalogue of the fifth international photographic salon, held under the auspices of the California Camera Club, has come to

hand and is an unusually fine example of tasteful presswork. There are sixteen effective reproductions of prints exhibited and the entire contents are consistent and worthy of so notable an event. Indeed, this organization is to be heartily congratulated on this commendable achievement, and in fostering pictorial photography toward a higher artistic expression.

"Exposures Indoors"

Is the title of the latest issue (No. 157) in *The Photo-Minature Series*. This timely and truly valuable little handbook gives clear and practical information about the hundred and one problems surrounding indoor exposures—interiors or portraits—in homes, churches, factories, offices, and public buildings. The controlling factors are explained, with tables and helpful diagrams. We know of no better text-books for the photographer who wants to know than this practical series, covering a wide range of information at the low cost of twenty-five cents each. Copies supplied through your dealer, or this office.

Hicography Becoming Popular.

Now that photographs can be made in color, using your own camera, simply by taking a pack composed of two plates and a sensitized film, slipping it in an ordinary single plate into your camera, whatever the make, and taking a photograph IN COLOR, of which you may make as many reproductions as you want, photographers all over the country are making inquiries—for all this is actually made possible by "The Hiblock."

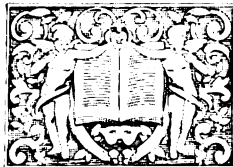
Many felt that color photography was to them a forbidden field so long as a special camera was required. But the Hiblock does away with all that. Here, bound together, are two sensitized blue and red plates with a green film interposed. One exposure only, as usual, and you have the colors separated and held by the three plates. Like every large epoch-making development, it is simple and it is just as simple for you to perfect yourself in its use. The Hess-Ives Corp. will gladly send you a booklet telling you fully about the Hiblock and its possibilities—a subject that no progressive photographer whether he be professional or amateur should pass by without full investigation. Simply a line and this literature is yours for the asking. Address 1201 Race Street, Philadelphia, Pa.

An Amidol Developer which Gives Strong Contrast

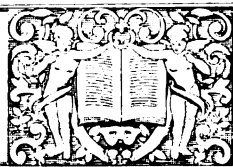
THE following is recommended as giving very strong contrast and will interest those who like amidol:

Water	10 oz.
Amidol	24 gr.
Anhydrous sodium sulphite	80 gr.
Sodium bisulphite solution	1 oz.
Potassium bromide	20 gr.

Especially suitable for bromide paper.



AMONG THE SOCIETIES



Federal Photographic Society, Washington, D. C.

ON Thursday evening, January 4, 1917, Mr. Carl Oswald, Washington representative of the Bausch & Lomb Optical Co., addressed the Federal Photographic Society at the New National Museum on the subject of "Photographic Optics."

Mr. Oswald's address was well illustrated with stereopticon slides. The merits and demerits of photographic lenses, from the "pinhole" to the most modern anastigmat lens, were discussed in a most able manner. Mr. Oswald laid special stress on the defects of lenses and their cause; but, unlike most lecturers on the subject, he pointed out how to locate the defects and a remedy if one was to be had.

The Federal Photographic Society has arranged a program for their meetings to be held during the winter which they believe will be of great interest to the public and at the same time be of great educational value to the photographer.

Regular meetings are held in room 43, at the New National Museum, on the first Thursday of each month.

The officers for 1917 are: Dr. Thos. W. Smillie, honorary president, Smithsonian Institution; H. T. Cowling, president, Interior Department; A. H. Linsenmeyer, first vice-president, Interior Department; L. W. Beeson, second vice-president, Department of Agriculture; E. L. Crandall, corresponding secretary, Department of Agriculture; F. B. Kay, recording secretary, Navy Department; A. A. Ruark, treasurer, Department of Agriculture.

Executive Board: J. E. Bishop, War Department; E. S. Shipp, Department of Agriculture; J. C. Carter, Department of Agriculture.

Anyone who has passed the U. S. Civil Service examination for photographer, or who is interested in the advancement of scientific photography, or who is actively engaged in photographic work, is eligible to active membership. Any one interested in the art of photography may be eligible to associate membership.

In all cases, applications for membership will be passed upon by the board of directors. The annual dues are three dollars, payable in advance or quarterly in advance. These dues, which will be returned in case the application is rejected, should accompany the application.

Address all communications to Mr. E. L. Crandall, corresponding secretary, 1752 Euclid Street, N. W., Washington, D. C.

Middle Atlantic Association

THE Middle Atlantic States Association comprising Pennsylvania, District of Columbia, New Jersey, Delaware, Maryland, and West Virginia, has made arrangements to hold its annual convention in the Scottish Rite Temple,

Philadelphia, on March 27, 28, and 29. A splendid program has been prepared, including the services of Pirie MacDonald, Alice Boughton, Buxbaum, Clarence White, Eduard Blum, Mrs. Bradin, E. Myer Silverberg, the artist, and others. Allowing for the usual enthusiasm with each new meeting place, this promises well.

Missouri Valley Association

THIS year's annual convention of the Missouri Valley Photographers' Association in Kansas City gives promise of being one of the largest gatherings ever held in the middle west, according to L. S. Kucker, president of the association. Mr. Kucker has returned from Kansas City, where he attended a four days' meeting of the executive board.

The meeting was held, among other purposes, to select the dates for the annual convention. The gathering will be during either the last week in July or the last week in August, in Convention Hall.

Plans for instituting a membership campaign were discussed. The present membership is about 300. It is expected that this number will be doubled before the coming convention. Heretofore, it has been the custom to increase the membership by soliciting photographers not members who attend the association meetings. The new plan is to enlist the coöperation of dealers in photographers' supplies and representatives of wholesale houses to solicit new members when coming in contact with the trade.

Meeting of Geneva Section, New York State Association

A MEETING of the Geneva Section of the New York State Association of Professional Photographers was held on January 30th, in the studio of Miss Mary Stewart, Canandaigua, N. Y., chairman of the association for this section. Members of that district and officers of the State Society were present. Among those present were: State President E. L. Mix and ex-President E. B. Core, both of New York; Vice-President J. E. Hale, of Geneva; H. B. Tuttle and Mr. Gilmore, of Geneva; E. E. Spedding, of Ithaca, and N. W. LeClear, of Waterloo. Dinner was served at the J. E. Murphy restaurant.

Professional Photographers' Society of Rochester Banquet

THE Professional Photographers' Society of Rochester held a banquet on January 31, at the studio of L. E. Allen, No. 158 Main Street east, Rochester, N. Y. The guests were E. L. Mix, of New York, President of the New York State Society, and E. B. Core, of Yonkers, State Vice-President. E. A. Smith, of Honeoye Falls. J. E. Mock and William M. Furlong were the speakers.



THE WORKROOM

By the Head Operator



ACID BLEACHERS
TONING LANTERN SLIDES
DEVELOPMENT OF PLATES AFTER FIXING
SLOW DEVELOPMENT FOR DIAPOSITIVES
OBSCURING THE SKYLIGHT
LENSES AND PLATE SIZES
WORKING-IN BACKGROUNDS
AN ADJUSTABLE EXPOSING BOX
AN IMPROVED METHOD OF COVERING AUTOCHROMES
INTENSIFYING BROMIDE PRINTS
TONING GASLIGHT PRINTS WITH URANIUM AND
SULPHUR
A CHEMICAL "FADE-OUT"
ADJUSTABLE EXPOSING BOX

EFFECT OF LIGHT ON SOLID SILVER CHLORIDE AND
BROMIDE
SUBSTITUTE FOR PLATINUM
DEVELOPMENT WITH TWO SEPARATE SOLUTIONS
PHOTOGRAPHY ON FABRICS IN PLACE OF PAPER
NEWSINESS IN A PICTURE. WHAT IS IT?
NOTES ON LANTERN SLIDES
THE USE OF CHIFFON IN ENLARGING
FOG—AND HOW TO DEAL WITH IT
A RAPID FIXING BATH
OVERWORKING THE DEVELOPER
HANDLING UNDEVELOPED PLATES
THE HEIGHT OF THE CAMERA
RANDOM NOTES

Acid Bleachers

IN photography one of the most frequent causes of failure is the habit of using solutions of which the composition is doubtful owing to their having been used before. We do not know how much of this or that ingredient has been used up; and, in practice, it may be taken as certain that the best policy in the long run, in all important operations, is to avoid risks, by using fresh solutions wherever possible.

For this reason, the acid bichromate and acid permanganate bleachers possess a great advantage over ferricyanide and bromide, because they are so cheap that there is no temptation to store them and make them serve over and over again. Moreover, they are both to some extent, the permanganate especially, hypo eliminators; so that traces of hypo which would be fatal in the presence of ferricyanide may be ignored, particularly when permanganate is used. With bichromate I am uncertain on this point, but have a suspicion that the tone is slightly affected by the presence of hypo.

An Acid Bichromate Formula

The bichromate bleacher may vary widely in composition as far as the relative proportions of its ingredients are concerned; but the most efficient and active combination is made by taking forty minims of a 5 per cent. solution of potassium bichromate, sixty minims of dilute hydrochloric acid (pure hydrochloric acid, sp. g. 1.16, diluted with four times its bulk of water), and adding water to make one ounce. The solution will keep in corked bottles.

With fresh solution bleaching is complete, unless the print is exceptionally deeply printed or strongly alumed, in from one to one and a half minutes, and there is usually a faint image left. Some workers get patchiness, but this I cannot understand; it is a thing which ought never to occur. Failure in bleaching with bichromate is generally due to the yellow stain

not being got rid of before sulphiding. By artificial light this stain is easily overlooked; and the result is a yellowness in the final tone which no subsequent clearing will remove. The stain may be washed out before sulphiding, but this takes time.

An Effective Clearing Bath

The use of an ordinary clearing bath is attended with some risk; but one made as I will describe, which contains hydrochloric acid and not too much sulphite, acts quickly, and may be used with perfect safety. This clearing bath consists of a dram of a 25 per cent. solution of sodium sulphite, and a dram and a half of dilute hydrochloric acid, as just mentioned, diluted with water to make four ounces. It should be noted that if a clearing bath containing bisulphite or metabisulphite, or alum, is used, it is necessary to add a certain proportion of common salt to safeguard the image.

The clearing solution just described may be kept in a concentrated form, say four times the strength given above, and then diluted as required. It takes from one to two minutes at most, and should the action not be complete in this time, it may be taken as certain that the clearing bath is used up. It is efficient only so long as it smells distinctly of sulphurous acid. Old solution should not be strengthened or returned to the stock, but thrown away.

After clearing, the prints only require rinsing in about three changes of water, occupying about one minute, before sulphiding. The sulphide solution should be fresh and of a strength of about two grains to the ounce. To make sure, it is just as well to finish with a second bath of fresh sulphide. The tone is exactly the same as if we used ferricyanide.

The only objection to be raised to bichromate is its poisonous action on the skin; but if prints are bleached singly there is no need to bring the solution in contact with the fingers, so that this objection has no force.

Bleaching with Acid Permanganate

Coming to acid permanganate, an efficient and simple formula is one which can be made up as required from two stock solutions: (A) A solution of 40 grains of potassium permanganate in water to make one pint, and (B) pure hydrochloric acid diluted as described above. These solutions keep indefinitely, and the bleacher is made by taking a dram of A, from 50 to 60 minims of B, and diluting the mixture to make 1 ounce.

Bleaching with this takes about one and a half minutes, and a very slight image, if any, is left. The very slight pink stain may be disregarded, and after a rinse in, say, three changes of water, occupying about one minute, the prints may be sulphided direct. In order, however, that the best tone and the purest whites may be ensured, it is necessary, after the sulphide solution has been washed out, to pass the prints through the clearing bath as used for bichromate.

The only objection to permanganate is that the mixed solution will not keep, and that, if bleaching is prolonged, it may become muddy in use. Should this occur, however, no harm is done. All that is necessary is to add a little more stock solution A and continue the bleaching. There will be perhaps more stain, but that is very easily removed in the final clearing bath after sulphiding.

Permanganate and Phosphoric Acid

Recently, however, the writer has worked out an acid permanganate which does not suffer from these disabilities, while it is quite as active and efficient as the mixture of permanganate and hydrochloric acid. This is also made up from two stock solutions: (A) 40 grains of potassium permanganate in 20 ounces of water, as just described, and (B) 2 ounces of common salt and a half fluidounce of "syrupy phosphoric acid 66 per cent., sp. gr. 1.5," with water to make 20 ounces.

It is essential that the salt be free from added farina, which is present in some fancy table salts. A salt which yields a clear solution in cold water will be satisfactory.

The working mixture consists of 1 dram of A and 4 drams of B, with water to make 1 ounce. This quantity is sufficient for a print of about 30 square inches or less, which works out at 4 ounces of solution for a 12 × 10 inch. Should this prove insufficient, it is only necessary to add to the mixture in the dish a little more stock solution A. The solution does not become muddy, nor does it deposit any sediment on standing. With the addition of more A it may, in fact, be used for several prints in succession, while in all other respects it resembles the mixture of permanganate and hydrochloric acid previously described.

Instead of the phosphoric acid we may substitute, along with the salt, potassium bisulphate, sometimes called pyrosulphate, $K_2S_2O_8$, but the phosphoric acid is preferable. If the salt is omitted, either mixture may be used instead of the usual acid permanganate as a reducer for negatives.

Non-acid Permanganate

A solution containing half a grain of permanganate and 24 grains of salt to the ounce will act as a bleacher by itself. It takes about double the time of the acid mixture, leaves a considerable image, free, however, from any patchiness, and causes much stain, but this yields readily to the clearing bath as used for bichromate. A most curious thing is that this non-acid permanganate invariably yields a distinctive tone, viz., a pure warm brown. It is most suitable for fairly vigorous prints and strong sunshine effects, particularly in woodland subjects. In close proximity to prints of the usual sulphide tone, it tends by daylight rather to yellowness, so that its use is indicated more for special pictorial than for general work.

One other point should be mentioned. In using acid bleachers it is necessary to avoid contact between the liquid and metals or compounds of the heavy metals. A friend of the writer could never succeed with permanganate until it was discovered that he was using dishes painted with bath enamel. All dishes must be acid-proof, or covered with acid-proof varnish. Enamelled iron, glass, porcelain, or vulcanite are perfectly safe.

As regards the relative cost, phosphoric acid, being the stronger acid, works out in practice as cheaper than hydrochloric. Bichromate, if used to the point of exhaustion, is probably slightly cheaper than permanganate at present prices, but as the bichromate is unlikely to be anywhere near used up, the cheapest of all is probably phosphoric acid and permanganate.—T. H. GREENALL in *Photography*.

Toning Lantern Slides

At the present time of year, when lantern-slide making and the exhibition of lantern slides for lectures are occupying the attention of many photographers, the question of economy in production is frequently an important one. The division of negatives into groups of approximately similar density, the careful testing of exposures and the use of a developer of pre-ascertained strength, for dealing expeditiously with under, over, and normal exposures are points to be considered.

Yet the fact remains that, in spite of these precautions, a considerable number of lantern plates are spoilt every year by amateur photographers. The usual suggestion offered for the utilization of spoilt lantern plates is to clean off the gelatin and use the glass for cover glasses. But the slide need not be discarded unless the film itself has been damaged. If the gelatin is intact the slide should be properly fixed, washed, and dried, and an attempt made to save it by transforming it into a slide of correct density. It is not always easy during development to gauge the exact density of the finished plate, and as the coating of emulsion on lantern plates is very thin, so much is lost in fixing that one is frequently left with a slide too thin to be of any use.

Weak or thin lantern-slide prints can be intensified to almost any extent by suitable

methods, and as there are several methods of intensification which give at the same time very pleasing tones, a double purpose can be served. If, however, development has been carried too far, in conjunction with a full exposure, the slide will be too dense for showing on the screen, and reduction must be resorted to. In this case the ordinary hypo-ferricyanide reducer can be used with advantage to bring down the density. In fact, a great number of eminent slide-makers always slightly over-expose and over-develop their lantern plates, and so produce a full, dense image, containing all the gradations of the original. The image when produced under these conditions has generally a tendency to be a warm black in color, and when reduced back to normal density frequently assumes a very pleasing cool sepia tone; and, in addition, the slide takes on a sparkle and brilliancy that lend an added charm to the picture when seen on the screen. In the toning methods which follow it is assumed, however, that the slide has not been developed far enough, and the image is too thin.

In practically all methods of toning or intensification (or both) success primarily depends on the complete washing out of hypo from the film after fixing; it is almost equally important that the fixing be sufficient. A lantern plate will usually appear fixed in from three to four minutes, but the process is *not* complete as soon as it appears to be. Give the plates ten minutes to fix, and wash them in at least ten changes of water of five minutes each, or in running water for half to three-quarters of an hour. Hypo eliminators are very useful to ensure ridding the film from the last traces of hypo, but they are never *necessary* if you give ample washing in ordinary water.

A beautiful warm black, accompanied by intensification, is obtained by first bleaching the plate in—

Mercury perchloride	20 gr.
Ammonium chloride	20 gr.
Water	4 oz.

When the film appears creamy white, thoroughly wash it, and then "redevelop" in

Sodium sulphide	$\frac{1}{2}$ oz.
Water	10 oz.

The image returns in this solution, considerably more vigorous in character and a beautiful brown-black.

A still warmer brown is obtained by first bleaching in the following solution:

Potassium ferricyanide	20 gr.
Potassium bromide	60 gr.
Water	4 oz.

When "bleached," the plate is well washed, and treated with the sodium sulphide solution given above.

A bright reddish-brown tone, also accompanied by intensification, and therefore very suitable for weak or thin images, is obtained in one operation with the uranium bath. This is prepared as follows:

Uranium nitrate	20 gr.
Potassium ferricyanide	20 gr.
Acetic acid (B. P.)	40 drops
Water	4 oz.

The image quickly turns brown, and finally a Bartolozzi red, in this bath, and in drying both the tone and the degree of intensification increase, so that it should be taken out of the solution, well rinsed, and dried *before* the desired tone is reached. It is so important to have the film free from hypo in this process that a hypo eliminator may be used with advantage.

Blue tones can be obtained with plates treated with the uranium bath by placing them, after washing, in a solution of:

Iron perchloride	$\frac{1}{2}$ oz.
Water	5 oz.

For dealing with the over-dense lantern slides referred to previously, making up the reducer is a point worth attention. It should be fresh, but not too strong, or the remedy will be worse than the disease. Dissolve 1 ounce of hypo in 5 ounces of water. Add a few drops of

Potassium ferricyanide	$\frac{1}{2}$ oz.
Water	4 oz.

until the solution becomes lemon-yellow. Use at once. Here again the action tends to continue after removing the plate from the bath, so that the process should be stopped in ample time, and the plate thoroughly well washed and dried.—*Amateur Photographer.*

Development of Plates After Fixing

By utilizing a complex physical developer, the composition of which was first given by Neuhauss (*Photographische Rundschau*, 1898, p. 257; 1904, p. 34), the latent images can, as we know, be developed on gelatino-bromide of silver plates, after fixing in hyposulphite of soda.

This process has given satisfactory results only when greatly over-exposing the sensitive substances employed. When developing after fixing by the processes described, the time of exposure for development before fixing must, in fact, be multiplied by about 20.

We have endeavored to remedy the inconveniences of the Neuhauss process, which involves too long a time of exposure, and is complicated and delicate in application. Moreover, the images are satisfactory only when development is done slowly.

We have also considered the possibility of replacing the silver salts in the developer by other metallic salts. Experiments soon showed that the conditions of the previous fixing play an important role in the final result. By employing more and more diluted solutions of hyposulphite of soda for this fixing, we found that over-exposure became less and less necessary; the maximum percentage of the fixing-bath seemed to be about 2 per cent. At this strength the coefficient of over-exposure falls from 20 to 4 with slow plates, and 6 with rapid plates.

Saturated solutions of sulphite of soda, employed as fixer, gave us better results still in the case of fine-grain slow plates, but they are

unsuitable for rapid plates, fixation becoming much too slow.

Development with Salts of Silver

Among the numerous silver salts we employed, the double sulphite of silver and sodium seemed the best. We consequently replaced the complicated Neuhauss developer with the following formula:

A		
Water	1000 c.c.	
Sulphite of soda, anhydrous	180 gm.	
Nitrate of silver	75 gm.	

(This formula was recently published by M. Chanoz, to whom we sent it apropos of the development, after fixing, of prints obtained with X-rays (*Comptes Rendus*, T. 152, p. 1576). M. Chanoz thus obtained good results in developing radiographic prints after fixing.)

B		
Water	1000 c.c.	
Sulphite of soda, anhydrous	20 gm.	
Paraphenylene-diamine	20 gm.	

For a plate 13 x 18 cm. take:

Solution A	150 c.c.
Solution B	20 c.c.

The paraphenylene-diamine in the solution B can be replaced by the same quantity of one of the following developing substances: metol, hydroquinone, pyrogallol acid. Either of these allows of more rapid development than with paraphenylene-diamine, but the developer becomes turbid much sooner than with the latter, and deposits silver on the image.

Speed of development can be varied by increasing or decreasing the proportion of developing solution specified in the foregoing formula; the variations in time of development produce changes of color of the final image. Moreover, the more rapid development, the quicker the bath becomes turbid.

Development with Mercury Salts

We endeavored to replace the silver salt in the developer already described by other metals, the sulphites of which are soluble in excess of sodium sulphite. Mercury alone gave interesting results and in certain cases the mercury salt seems even preferable to the silver salt, because it gives less dichroic and more opaque images.

Moreover, by prolonged development there is less tendency to fogged images.

Finally, mercury developers remain clear much longer than silver ones, and deposit no precipitate on the images, even after long treatment. On the other hand, the solutions with the mercury base act slowly, and give images with marked contrasts, especially in case of under-exposure. Our numerous experiments led to the following formula:

A		
Water	1000 c.c.	
Sulphite of soda, anhydrous	180 gm.	
Mercury bromide	9 gm.	

B		
Water	1000 c.c.	
Sulphite of soda, anhydrous	20 gm.	
Metol	20 gm.	

For a plate 13 x 18 cm.

Solution A	150 c.c.
Solution B	30 c.c.

are employed.

In any case, whether the developer be compounded with silver or mercury salts, fixation of the plates before development should be done in a 2 per cent. solution of hyposulphite of soda.—A. and L. LUMIERE and A. SEYEWETZ. (From a paper read before the French Academy of Sciences.)

Slow Development for Diapositives

Fotografia Pratica gives the following developer as being excellent for developing diapositives for stereoscopes or for projecting:

A			
Water	300 c.c.	3½ oz.	
Hydroquinone	3 grams	50 grains	
Sodium bisulphite	4 grams	65 grains	
Potassium bromide	1½ grams	23 grains	

B			
Water	300 c.c.	3½ oz.	
Caustic soda	5 grams	77 grains	

C			
Water	300 c.c.	3½ oz.	
Ammonium bromide	15 grams	½ oz.	
Ammonium carbonate	15 grams	½ oz.	

For normal exposure take 15 c.c. of A (½ oz.), 15 cc. of B (½ oz.), and 8 cc. of C (¼ oz.) in a half litre (17 oz.) of water. The picture will appear in gray-black tone in about ten minutes. For exposure one and one-half times the normal, take the same proportions plus 20 cc. (¼ oz.) of C. This will give various tones with 15 minutes' development. By exposing three or four times the normal, using the same developer, in from 30 to 40 minutes purple or rose tones may be obtained.

The quantity of water may be doubled or trebled to prolong the development, without changing the quantity of chemicals. The more diluted the developer, the warmer will be the tone of the print.

Obscuring the Skylight

THE following is a suitable formula:

Whiting	13 oz.
Ultramarine blue	100 to 120 gr.
Gelatin	1½ oz.
Water	24 oz.

B	
Glycerin	1½ oz.
Starch	½ oz.
Boiled in water	10 oz.

(Add B to A)

After all is dissolved, brush it on the glass with a three-inch flat paint-brush. Warm the solution every time you move the ladder, and stir it. Add water a little at a time as the solution is used, as it will gradually get thicker. The best effect can be produced by using the solution

quite warm and when the sun shines on the skylight. The coating can be easily removed with a sponge in the beginning of winter or in the spring before recoating.

Lenses and Plate Sizes

It is customary when describing a lens to give the size of plate which it will cover, so that we hear of "quarter-plate" lenses, "10 x 8" lenses, and so on; but the method is open to objections, which it will be well to note. An important one is that in these days, when the rising front is so greatly used, it is not much use to have a lens which will only cover a plate of the size that is employed. If we have, we find that as soon as the front is raised the bottom corners are cut off, and in the negative we get patches of clear glass at the two top corners of the picture instead of an image. The lens should actually cover a much larger plate than the one with which it is to be used. If it will cover a half-plate, it is none too large for quarter-plate work on a modern type of camera. Another objection is that such a description is not explicit. For example, it is not evident at first sight that a "5 x 4 lens" will cover a $5\frac{1}{2} \times 3\frac{1}{2}$ in. plate; yet it will be found that these two sizes are almost identically the same. A much better plan than naming the size of plate would be to give the diameter of the circle over which the lens will give an image. We should then be able to see at a glance what plate it would cover, and also the extent to which the rising front could be used. Another anomaly that may be mentioned in connection with this subject is that the extent of rise permissible with any given lens depends upon the way of the plate. If this is vertical, it can be raised more than if it is horizontal. For example, a lens must cover a circle $6\frac{1}{2}$ in. in diameter, if it is to be used with a quarter-plate and to allow the front to be raised an inch, with the plate horizontal, and is not to cut off at the corners. Anything more than the 1 in. rise will cause the corners to be cut off; but if the plate is used the upright way, instead of the horizontal, the front may be raised nearly an inch and a half, we shall find, before there is any cutting off.—*Photography*.

Working-in Backgrounds

Mix a lot of old 8 x 10 and 5 x 7 negatives, cleaned, with some emery flour, water, tin box-cover, elbow grease, and a rainy day, in such a way as to result in a lot of 8 x 10 and 5 x 7 ground-glass, which keep as stock.

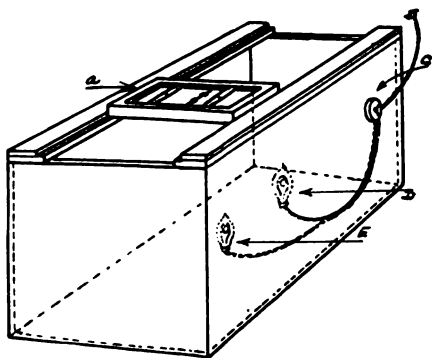
In place of "working-in" a background on ground-glass varnish, with spring clips hold the face of your 5 x 7 negative to the back of an 8 x 10 ground-glass, keeping its edges some little way from the edges of the ground-glass. Now on the retouching frame, work up with pencils on this ground-glass your background, putting in deeper shadows with vaseline on ball of finger. To print, adjust back of negative to face of ground-glass in 8 x 10 frame. Such a background can be kept for use with other similar negatives, and modified in a few minutes to fit each. To print down white draperies,

lay ground-glass face out in frame. Put negative on this. With vaseline on ball of finger, work over the drapery. In desperate cases use this together with ground-glass varnish treatment on back of negative. You can also modify backgrounds with pencil and vaseline in the same way.

An Adjustable Exposing Box

ANY time- or labor-saver is always appreciated. The following device, an adjustable exposing-box, is easily made and should be especially appreciated by the novice or amateur photographer.

A glance at the sketch readily discloses the general construction. The tongued top is made of two strips of half-inch material far enough apart to accommodate the printing frame to be used.



A. PRINTING FRAME. B. CORD TO SOCKET. C. THREE-POINT SWITCH. D. FORTY-WATT BULB. E. TWENTY-WATT RUBY BULB.

To operate: Throw the red light on and the white light off with the three-point switch; open the printing frame, leaving it still in the box, and put in the blank print; close and throw on the white light until of sufficient exposure; then turn out the white light and throw on the red.

If the negative or film is of even exposure, leave the printing frame directly over the white light, but if the film is of uneven exposure, or if one side of the picture is to be brought into greater relief, slide the frame to one side of the light, leaving nearer the light that side which is to have the greater exposure.

An Improved Method of Covering Autochromes

AUTOCHROMES, if they are to last any length of time, must be varnished; but it is very difficult to get a perfectly smooth, unbroken, varnished surface on account of the dust particles which are always to be found adhering to the film. The particles are not obtrusive in themselves, but they cause the varnish to form ridges which are very unsightly. These defects can be completely avoided by cementing the cover-glass to the plate with Canada balsam; and as at the same time the plate is made com-

pletely damp-proof, the transparency considerably increased, and parallax reduced, it is well worth the slight extra trouble.

The cementing is best done in front of a fire, near which the cleaned cover-glass is placed to get thoroughly hot. The autochrome should also be warmed, and the balsam applied to it with a small spatula; although a match-stick is quite adequate. It should be spread in two smooth streaks running from corner to corner of the plate, thicker in the centre where they cross, and tapering toward the corners. This results in a minimum of waste, and when the cover-glass is applied the balsam can be made to spread evenly to the edges with very little trouble. The correct quantity can easily be judged after one or two trials, the aim being to use just enough to reach all four edges together when gentle pressure is applied around the middle of the plate. Any violent local squeezing should be avoided, as it usually defeats its own purpose. The plate should be kept warm throughout the process or the balsam will not flow. Too much heat, on the other hand, is liable to crack the starch-grain coating.

It is important to apply the cover-glass at one edge first, gradually lowering it on to the balsam like the cover of a book. If this is not done, large air-bells are imprisoned between the cover-glass and the balsam, which are very difficult to get rid of. Some few air-bells are, of course, unavoidable, but the majority squeeze out, and any which remain, if no larger than a pin's head, disappear in course of time.

When the balsam has worked through all four edges, the plate should be put aside for a day or two in a horizontal position in a cool place where air can get freely to the edges. The extruded balsam is then removed, and after another few days for the edges to harden the plate can be bound up as usual and the glass surfaces cleaned with benzol or petrol.

The added brilliancy and smoothness imparted by this treatment is surprising, and is particularly noticeable when the plates are used for projection. Autochromes which have already been varnished, whether with gum dammar or celluloid, can also be cemented with success, any ridges or flowing-marks being completely obliterated. It is, perhaps, unnecessary to point out that plain thick balsam should be used, the solution in benzol or toluol being useless.—*Photography.*

Intensifying Bromide Prints

It may be useful to give a method of very considerably increasing the strength of bromide prints. In cases where the weakness of the image has been caused by over-exposure in the printing frame or enlarger, it is better to discard the failure and rectify the error when making the next print, but in working with a negative possessed of too little contrast to give an effective result it is an advantage to be able to intensify the print. The writer's previous essays in this direction had not been too encouraging, and it appeared impossible to eliminate a frequent risk of staining; it was then considered that the acid-amidol developer which had proved so useful in the redevelopment

process might also solve the intensification difficulty.

To begin with, the dish must be clean—not only clean to the eye, but chemically so—and it is quickly brought to this condition by pouring into it a small pool of strong solution of potash permanganate, and adding about half as much sulphuric acid; this mixture, flowed over the bottom and up the sides, will leave the dish as brilliantly white as when it left the pottery, and, as a matter of fact, porcelain dishes used for development should be subjected to this treatment when their appearance suggests it.

In the clean dish is placed the fixed and thoroughly washed print, which is then flowed with the bleacher consisting of—

Water	10 oz..
Water	10 oz.
Mercuric chloride (corrosive sublimite—poison).	$\frac{1}{2}$ oz.
Hydrochloric acid	30 min.

After disappearance of the image a washing is given in running water of not less than five minutes. This is ample for a single print, but if several are being treated together a quarter of an hour will be necessary, and they will also require lifting from bottom to top a few times.

Development is effected with amidol a salt-spoonful, sodium sulphite a teaspoonful, sodium bisulphite lye 30 minims, water 3 oz. A short washing completes the operation.—*Amateur Photographer.*

Toning Gaslight Prints with Uranium and Sulphur

THERE appears to be a great deal of misconception about the use of the salts of uranium as a toning agent. The question has often been asked, What is uranium—because the name has so often occurred in the line of photography. Uranium is a metal; it was discovered by Klaproth, a Swedish chemist, in 1789. It is obtained from pitchblende or uranite, these substances being the natural oxides of uranium. The name uranium was given this metal after the planet Uranus, which had then been discovered by Dr. Herschel, the astronomer. Today it is well known that uranium and its salts possess the properties of radium, only in a lower degree; in fact, radium is regarded as an offspring of uranium, this latter metal being often spoken of as the parent element.

There are three salts and two oxides of uranium: the sulphate, chloride, and the nitrate. It is this last salt that is used mainly in the art of photography. It can be used either as a sensitizing agent or a developing agent. With these subjects the present article is not intended to deal. The use of the nitrate of uranium as a toning agent for the changing of the color of a weak black platinum print into a beautiful Bartolozzi red is very well known. When these prints are properly treated to secure the right color, their permanency appears to be as good and in many cases better than thousands of the prints made today by some of the silver printing-out processes.

The writer possesses many of these uranium-toned prints that were made eleven years ago, and not a single print has faded during this time. The whites are perfect, and the color remains the same. In the case of uranium toning the color obtained is due to a deposit of the ferrocyanide of uranium, and it will be invariably found that where failure occurs to secure the right color it is due to the ferricyanide of potassium (red prussiate of potash) having been exposed for some time to the action of daylight, which affects the salt and makes it useless for toning purposes in combination with the salts of uranium.

Some very charming colors can be obtained upon prints made with the gaslight or artificial light developing papers. The solutions need not be made as strong as those that are used for the toning of platinum prints.

Solutions made up as follows will prove satisfactory, always bearing in mind that the more acid the bath is made the more intensely red will be the resultant print. Several prints can be toned in the bath at the same time, although it is advisable not to attempt to tone too many at a time.

For the toning of the ordinary developed print, make up the following mixtures, and label the bottles No. 1 and No. 2. The uranium salt may be made up in a white glass bottle if no other kind is at hand, but the ferricyanide of potash solution must be made up in an amber-colored bottle, owing to its sensitiveness to light.

No. 1 Solution

Nitrate of uranium	60 gr.
Distilled water	30 oz.

No. 2 Solution

Ferricyanide of potassium (red prussiate of potash)	60 gr.
Water	30 oz.

For making up the correct toning solution, take equal parts of No. 1 and No. 2. Be sure and mix them under a weak artificial light (make under ordinary gas-jet) and carry out the toning by this light. Add to the mixture (if dry, four ounces of each are used) one ounce of acetic acid No. 8; rock the tray so that the solutions are well mixed, then place into it a dried print that has been thoroughly well washed previous to drying; now rock the tray so that the solution flows well over the print, and continue the rocking, when it will be seen that the print changes color rapidly. As soon as the print has reached the desired color remove it and wash well in running water; in fact until the yellowness has disappeared from the drapery and the whites of the print. It may then be blotted off in clean blotters and hung up to dry by means of a clean wood clip, and when dry trimmed and mounted like any other print.

Where a gaslight print is to be sulphur-toned the procedure is entirely different. The two following formulæ will give excellent results, the brown color and sepia being perfect in every way.

Make up the following solutions:

A	
Water	24 oz.
Ferricyanide of potash	1 oz.
B	
Water	24 oz.
Potassium bromide	1 oz.
C	
Water	60 oz.
Monosulphide of sodium	$\frac{1}{4}$ oz.

The bleaching bath is made as follows: Mix in a tray five ounces of A and five ounces of B, add a few drops of strong water ammonia, place the print into this mixture, rock the tray, stop as soon as the print has become well bleached. Remove it and wash well in running water for five minutes or more. Then place the print into a separate tray containing about ten ounces of the sodium sulphide solution, and it will change in color to a beautiful rich brown. Now wash the print well for one-half hour in running water, after which it may be dried and mounted.

The following formula will give a very beautiful sepia when used as a bleaching agent:

Bleaching Solution

Chloride of lime	2 oz.
Common alum	$\frac{1}{4}$ oz.
Water	30 oz.

Warm this mixture slightly, then immerse the print, and keep the tray in motion until the print is completely bleached. Then wash the print well in running water for fifteen minutes and place the bleached print into the following mixture:

Sulphite of soda	$\frac{1}{4}$ oz.
Water	20 oz.
Sulphuric acid	2 dr.

The above mixture must be stirred well before immersing the print. By this means a color is obtained quite different to the previous formula; the tone is very agreeable, and all that will be required after this sulphurizing will be to give the prints a thorough washing in running water for one-half hour before drying or mounting.

If a darker color is required the process must be repeated, but in ninety-nine cases out of a hundred the single operation is all that will be required.

A Chemical "Fade-Out"

PHOTOGRAPHERS who are frequently called to the laboratory to put the finishing touches to their pictures may find the following information of considerable value to them.

Quite frequently, owing to the cutting of a picture to present a different continuity, a "fade-out" is found necessary. One method of obtaining a desired "fade-out" on the negative or print is by the use of certain chemical combinations. One formula from which excellent results have been obtained is as follows: ■

Take a small tray or tank and dissolve 2 drams of potassium ferricyanide (commonly called red prussiate of potash) within it. After this compound is thoroughly dissolved leave it stand for about five minutes. In another tray dissolve about 2½ ounces of hypo. When it is fully dissolved mix it with other tray.

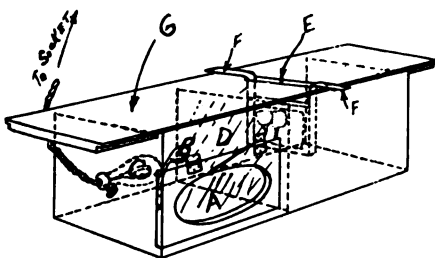
Then take your negative or positive and saturate the parts of the film that require the greatest reduction with water applied with a soft sponge. After emulsion is thoroughly moistened, take sponge and immerse it in reducing solution; after which delicately apply the sponge to that portion of the film that must be reduced to permit a "fade-out."

Should the reducer be slow in acting it is all the better, as it acts with greater strength on weak tones or shadow portions than on the strong tones; and it is safer when working upon a negative.—*Cinema News*.

Adjustable Exposing Box

THE accompanying illustration shows a handy arrangement with which an amateur or professional may make a number of prints of exactly the same shade of exposure, for once having found the right distance from the diffusing glass, it is but a matter of counting off the seconds. As seen by the cut, the automatic opening and closing door with the ruby panel permits the use of the light for both exposing and developing. The counter-balance attached to the door must be bent to the angle shown to work both ways.

The box is rectangular in shape, twenty inches or so in length and large enough to readily accommodate the printing frame which is to be used. The cover, six or eight inches longer still, is grooved to slide easily and truly. The slot for the frame is made somewhere over the center of the exposing compartment.



A, RUBY GLASS IN DOOR. B, COUNTER-BALANCE TO HOLD DOOR OPEN OR CLOSED (TACKED TO SIDE OF DOOR). C, ORDINARY ELECTRIC LIGHT BULB RUN THROUGH THE END OF BOX. D, GROUND-GLASS PARTITION DIFFUSING LIGHT EVENLY INTO EXPOSING CHAMBER. E, HOLE IN SLIDING COVER THROUGH WHICH TO LOWER PRINTING FRAME. F, F, TIN STRIPS TACKED TO SIDES OF PRINTING FRAME TO HOLD FRAME SUSPENDED IN BOX.

The electric-light fixture is fastened to the end of the box and a forty watt bulb inserted.

The ground-glass is cut to fit snugly into the box and spaced about ten inches from the end of the box. It is well to glue a soft strip of padding, such as felt, to the top of the glass to minimize the

friction of the sliding cover and to shut out any chance of stray light. The ground-glass can be purchased for 30 cents at the drugstore.

The strips of tin attached to the sides of the printing frame are tacked on and the upper ends bent as shown to engage the edges of the cover. They do not in any way interfere with the operation of the frame.

To operate, experiment on two or three prints to get the best distance; then, having found it, leave the cover alone, and make the exposures all the same length of time.

This arrangement of course is to accommodate those who of necessity or choice do their picture work at night.

The device is easily constructed and will soon pay for its existence in time and labor saved. When the full light is desired, simply throw the counter-balance past dead center and the door opens.

Effect of Light on Solid Silver Chloride and Bromide

COLLOIDAL metallic fogs are usually produced by fusing salts in contact with corresponding metals. The silver halides also form fogs when the solid salts are exposed to light. Optically clear crystals of silver chloride and bromide become more or less opaque and dark in color when exposed to a beam of light, but remain at first optically clear, the beam being invisible. Later the surface at which the beam enters becomes brown, and particles visible by the ultra microscope are formed. The particles grow rapidly and will continue to grow if the crystal is removed from the light and heated to 350° centigrade.

Heating in the absence of light does not produce particles. The growth of the particles is accompanied by a diminution of the coloration in their immediate neighborhood. The effect is evidently due to the separation of metallic silver in a colloidal form, growing in size as the illumination is continued.

These facts strongly support the view that the latent image consists of colloidal silver in an ultra microscopic form.—R. LORENZ in *Journal Chem. Soc.*

Substitute for Platinum

A CLOSE imitation of the platinum print (now prohibitive) may be had by the use of the following formula:

Make up first (A) the iron solution:

Ferric oxalate, clean bright	
crystals	560 gr.
Oxalic acid	75 gr.
Distilled hot water	3½ oz.

Then make a solution of permanganate of potash, 30 grains, and water, 1 ounce, which *add* to the iron solution.

Next (B) make a solution of 250 grains of nitrate of silver in 3½ ounces of distilled water.

For sensitizing, take 7 parts of the iron solution (A) and 3 parts of the silver solution (B).

Select a good grade of paper, with sufficient sizing to prevent absorption of the fluid.

If unsized paper is used, size with 15 grains of gelatin to the ounce of water, or with a thin starch.

The paper is coated by dipping a wad of cotton in the solution and brushing it evenly over the surface. The cotton should be well charged with the liquid, and after the surface has been well covered, the coating must be blended either by means of a brush, dipped in the fluid and shaken out, or by squeezing out the wet wad of cotton and going lightly over the surface.

Expose as with the genuine platinum paper; that is, until the detail in the high-lights just begins to show, and develop in oxalate of potash of the same strength as that used for the platinum print. Wash in two changes of weak acid water—one dram acetic acid (No. 8) to 30 ounces of water. Fix in hypo, 1 ounce; water, 16 ounces. Wash well.—*Bulletin of Photography.*

Development with Two Separate Solutions

DEVELOPMENT is of all the photographic processes that one upon which the greatest changes have been rung. If we turn back to the textbooks of a decade or two ago we find that they are filled with elaborate descriptions of the way in which the developer has to be modified to suit some particular conditions, or to adjust it to counteract errors that have been made in the exposure. Much of this we seem to have left behind. Such modifications are now rarely heard of, and are probably only practised by a few representatives of the "old school." We have gone to the other extreme; and in doing away with complications which were of no utility it is possible that we have lost sight of some which at times might be extremely valuable. One of these is that which we propose to describe briefly in this paper, namely, development with two solutions.

The particular feature about this method is that, unlike those which depend upon alterations in the composition of the developer as a whole, which cannot affect the density ratios, this is a kind of automatically-applied local action which does affect those ratios, tending to give proportionally greater development action in the least exposed parts than it does elsewhere. Moreover, as the effect of prolonging development when this method is adopted is to continue the action of the developer upon the less exposed parts, after development has practically ceased in the fully exposed parts, we can exercise a certain control over the effect by the length of time that the development is allowed to go on, contrast in the shadows being increased without fear of the high-lights getting too dense. It is therefore useful when the photographer has to deal with subjects in which the contrasts are extreme. Perhaps the reason for this will be more apparent after the method of working the process has been described.

Two-solution development can be used with almost any of the developers that are commonly employed. It may not be practicable with amidol and those compounds which, like it, do not require an alkali to render them active, but to any of those which do, the system is applicable. The developer itself—in the stock solutions, that is—must be kept in two solutions; it is obvious that a ready-mixed single solution could not be

used. It is with pyro-soda that it is likely to be most frequently applied, and the following account of the *modus operandi* deals with that developer.

Assuming that the pyro-soda developer in use is kept in the form of a ten per cent. stock pyro solution preserved with metabisulphite, or some similar salt, and that the alkali or No. 2 solution is one of a strength of a pound of sodium sulphite and a pound of sodium carbonate dissolved to make eighty ounces in all, we make the working pyro solution by taking a hundred and twenty minims of the stock pyro and diluting this to make three ounces in all. This gives us a bath of pyro containing four grains to the ounce, which may be taken as the weakest that is at all likely to be required. The strongest might consist of one ounce of the stock solution diluted to make three ounces, or a strength of sixteen grains to the ounce, but with a very strong pyro solution the particular advantage of two-solution work is lost. The alkali or No. 2 bath may consist of one part of the stock sulphite and carbonate solution with two parts of water.

The plate is first placed in the dilute pyro solution, and the dish rocked until there is no doubt that the whole of the surface has been well wetted and is absorbing the liquid. The dish can be covered, as there is nothing to see, unless it is to make sure that the liquid is flowing all over the film, and with occasional rocking the plate may remain therein for five minutes. Longer than this will do no harm, and if there are several plates to develop one may be soaking in the pyro while the other is being brought out in the alkali. On taking it out of the pyro, the surface is rinsed for a moment only, and the glass side as well, so that the only pyro carried into the alkali is that which is contained in the pores of the gelatin. At this point no image will be visible, but on placing the plate in the alkali solution and gently rocking the dish the image will make its appearance very quickly. The subsequent action is very similar to that which takes place in the ordinary form of development, except as regards the gradation.

It will be apparent at once that when a plate is developed in this way there is a limit set upon the extent of development which is possible by the exhaustion of the pyro solution. A fully exposed part of the negative is developed as far as the limited allowance of pyro which it has absorbed will allow the action to go, but when this has been used up the development in that part will cease. But in a part which has only been slightly exposed—which will have absorbed just as much pyro—the pyro will not be used up anything like so quickly, and so the action can go on for a much longer time. A little of the pyro will diffuse out into the liquid generally, so that one cannot expect to get quite abrupt stoppage, but in general what has been described takes place.

The result of carrying out development in this way is that after a certain stage in the operation has been reached, the high-lights of the negative cease to gain density, whereas the shadows and half-tones continue to do so for some time longer. When the action has gone far enough the plate is taken out and fixed.

While this describes the process in outline, it

may be pointed out that the photographer need not keep to the proportions given for the dilute pyro solution, but may vary them as observation indicates. It will depend, to some extent at least, upon the capacity of the film on the plates which he is using to absorb liquid, and different makes differ in this extent. If he finds that he cannot get the density he requires, no matter how long, within reason, he allows the alkali to act, it is an indication that the pyro solution must be stronger; while if he finds that the results are no different from what ordinary development would give, he may safely conclude that the pyro solution which he is using is too strong. One or two trials will soon show what strength is about right. There is no need for any very great precision in the proportions, as the operation is watched and terminated when it is seen that the action has gone far enough.

It may be added that this method of development is a very economical one. The pyro solution can be used over and over again, as long as enough of it remains to cover the plate; but in its diluted form it is best not to keep it over from one day to the next, as oxidation is sure to take place and there will be a risk of staining, even if the pyro has kept its energy, which does not always happen. A fresh alkali solution will be required for each plate.—*Photography*.

Photography on Fabrics in Place of Paper

PAPER is not the only material upon which photographs can be printed, although the great majority of photographers never use anything else. Textile fabrics can be sensitized by most of the preparations which are used for paper, and, within certain limits, the processes are the same. The particular material chosen will depend upon the kind of result required, but silk, nainsook, sateen, cambric, and canvas have each been utilized.

At one time several kinds of sensitized fabric could be bought ready prepared for use. Canvas coated with a bromide emulsion was made, which was suitable for contact printing as well as for enlarging. Silk was supplied sensitized both with a kind of p.o.p. emulsion and for platinum printing, and sensitive linen was also made. As far as the writer can learn, all these productions have long since ceased to be supplied. A year or two before the war he made enquiries for a sensitive textile material, but was told, in reply, that the demand had been so small that its manufacture was discontinued. In case there are workers who would like to try their hands at such a process, a few notes are here given, supplementing the article to which reference has already been made.

Before sensitizing a fabric, indeed before getting a fabric to sensitize, one must have a clear idea as to the purpose of the work, because this will influence the choice of material. Canvas is not very satisfactory in the hands of the amateur. Its coarse grain and porous open nature cause it to swallow up the comparatively expensive silver solution, and to give an image both rough and buried in appearance. Possibly the best way of getting a photograph with a canvas surface would be to stretch the canvas, well size it, and then transfer to it the image from a piece of

transferotype paper, or else to develop a carbon print upon it. A very fair canvas surface is got by mounting a bromide print on thin paper on stretched canvas. Prints on canvas and similar materials are, presumably, made to frame, with or without glass, on account of the texture which it gives.

Other fabrics are chosen because the prints made upon them can subsequently be worked up into cushion covers, d'oyleys, and similar articles. In such a case a smooth surface is required for all but very large prints, say, whole-plate size or over. These latter are very effective if a ribbed silk is used for them (bengaline). The image must not be carried in any vehicle of gelatin, or the material will lose its suppleness: so that only just enough of whatever sizing material is chosen should be used to keep the image from sinking in. It is possible to do without any size if the fabric is very thin; but, in such a case, both the salting and the sensitizing solutions, especially the latter, should be strengthened, and the printing carried to a fair depth.

One rule, never to be broken, is that whatever material is chosen it should be well washed, rinsed in clean, cold water, and dried before it is salted. For printing, it is most convenient to use a piece of card at least as large as the sensitized fabric, and to attach the latter to it by a few stitches at the edge. A mask so that the picture has a broad white margin will help to give a good result. There is no need to worry if the print looks dull and crumpled when dry—as it is almost sure to do—a gentle ironing will flatten it out and make all smooth again.—*Photography*.

Newsiness in a Picture. What Is It?

BEFORE me as I write is a paper with a very large circulation, in which appears the following advertisement, inserted by a great newspaper:

PHOTOGRAPHS WANTED

"We are in the market for good photographs of interesting news items. For these the highest market prices will be paid if accepted. We want pictures of human interest—episodes, beautiful women, distinguished men, or events or incidents that have a wide appeal—and we solicit these from both amateur and professional photographers. Scenery or artificially posed pictures of any kind are not desired: pictures MUST record NEWS."

Now that advertisement is very interesting in that it explains what the newspaper means by the word "news." All too many photographers think that a news picture must necessarily be a photograph of a fire, a procession, an accident, or even of the scene of a tragedy.

One of the best definitions of what a newspaper man really calls "news" is in a text-book for newspaper men by the Professor of Journalism in the University of Wisconsin. He says: "Although every good newspaper worker recognises news at once, and almost instinctively decided its value. Most of them find it difficult to express in brief form what news really is, and what determines its value," and then he proceeds to give the student the following quite

useful definitions, all of which apply to the news picture as forcibly as to news reading matter: "News is what people want to know about. News is anything people will talk about, and the more interest and excitement it creates the better news it is. News is the essential facts concerning any happening, event, or idea that possesses human interest. News is based on people, and it is to be gauged entirely by how it interests other people. The best news is that which interests the most readers."

The essentials of "news," it will be seen, as brought out by these definitions are: (a) that it must be of interest to the readers; (b) that it should be fresh, current, or timely; (c) that it should preferably possess the quality of "human interest."

A good composite definition of what makes a press photograph of news value, then, would be—that it records anything that interests a great number of people. The best news picture is the one which possesses the greatest interest for the greatest number.

It is not influence that is required to sell a news photograph, but the fact that it is the right thing. As Julian Ralph has written, "Provided you have the news microbe in your blood, the next thing is to do something for a newspaper. The press is not a charmed circle nor a secret fraternity. It is wide open and all-devouring. If I were stranded in a city and needed money, I would walk the streets until I saw something novel or peculiar to the place; and that I should describe as I saw it. I should not look for news. No one looks for news any more. That is an old-fashioned idea which outsiders persist in retaining. News of the ordinary kind is now gathered systematically by men stationed at all the outlets of it, like guards at the gate of a walled city, by whom nothing can pass in or out unnoticed."

This is very true also of picture-news: the press agencies and newspapers all have their own staff men at work on the news which may be called ordinary, everyday, current, or timely news.

In conclusion, let me point out a good way to develop the news instinct. Let the photographer when out with the camera regard himself as a newspaper man who has *got* to send in a good news picture that day. It is surprising how many really interesting subjects one may then take note of, all in a single afternoon.

But for goodness' sake never let news seeking spoil our hobby as a hobby. That, I think, is the one trace of bad in the popular desire among amateur photographers to make pictures that sell. Once we begin asking ourselves about every possible picture, "Will it sell?" we start to spoil our hobby; it will no longer be what is should—the most interesting and intellectual spare-time occupation ever evolved.—*Photography*.

Notes on Lantern Slides

Dextrin makes the best adhesive for attaching binding strips to slides. A thick paste made by mixing it with boiling water is all that is required if the strips are not gummed. If they are gum-

med, the dextrin may be a little thinner and used in place of water to moisten the gum.

ALTHOUGH many amateurs cut their binding strips into lengths of $3\frac{1}{4}$ inches, and bind each edge separately, the quickest and best way, and that followed professionally, is to use one long strip, binding all four edges at once. A small pair of scissors can be used to take triangular notches out of the strip at the corners, and thus prevent any extra thickness there.

If the enlarging lantern has extension enough, or can be fitted with a short-focus lens, it makes an excellent arrangement for slide making. The negative can be reproduced on the slide same size, reduced, or enlarged; and the exposures, with a condenser, make warm-toned slides on slow plates quite practical.

THIN silk tape is the best material for binding lantern slides that are to see much wear.

WHERE the finest definition is required in a lantern slide there can be no question but that it is obtained, not by contact but by the use of a lens. Glass is seldom flat, and almost all coated glass is curved so that the coated side is concave, and good contact between lantern plate and negative is thus unlikely to be obtained unless with a good deal of pressure.

A GOOD method of classifying lantern slides is to use a paper of a different color for binding the slides in each set.

MANY lantern slides can be wonderfully improved in the making by a little judicious local reduction. On taking the slide from the fixing bath, it should be put under the tap for a few minutes, and the work may then be done by applying ferricyanide and hypo with a brush or swab of cotton-wool. It is best to use the reducer fairly weak, and to rely on several applications, rinsing the slide between each, as it is easy in this way to work without making any hard dividing line between reduced and unreduced parts.

A TITLE slide furnishes an effective opening to a lecture, and is easily provided. One way of making it is to select some subject appropriate to the lecture, but which is not actually required for illustrative purposes. It should have a blank area, the sky for choice, and may have lettering for the title put into this blank area by making a separate (reversed) slide of the lettering and binding up the two together.

If a set has all the slides composing it arranged in due order and the right way up, and then holding them together as a solid square block, two lines—a thick and a thin one—are ruled diagonally from corner to corner along one side of the block, it will be easy at any subsequent time to tell at a glance whether the set is complete, and whether they are all rightly placed and in order. If they are, the two lines will run unbroken from end to end. White ink may be used for the purpose, if the ordinary black paper has been employed for the binding.—*Photography*.

The Use of Chiffon in Enlarging

THE purpose of this article is to explain a method of control in enlarging which will enable our readers to very considerably improve the quality of their work. Straightforward enlargements from negatives of critical sharpness are apt to have a crude appearance which renders them disappointing. To avoid this it is sometimes recommended to throw the image on the easel out of focus; but a more satisfactory method is to use black chiffon in front of the lens. The fabric should be of the finest and closest possible texture, and it is convenient to have the chiffon mounted in small cardboard frames, in thicknesses of one up to four. Fine chiffon is not the easiest of things for masculine fingers to handle; but if a three-inch square hole is cut in the centre of a piece of cardboard, the chiffon can be attached along the top and down one side with a little gum, drawn taut over the opening, and similarly fixed on the bottom and the other side. When dry, another thickness may be applied in the same manner. It is well to paste down a piece of card, with a similar opening, for protection, and diffusers made in this manner will stand continuous usage for a long period. The image having been focussed sharply on the easel, the diffuser is laid up against the front of the lens, and the exposure made.

It is the writer's experience that once a worker has been put in the way of using such diffusing screens, their employment is invariable. In the case of portraits, roughnesses of skin texture are smoothed as effectively and more naturally than by the retouching pencil, while landscapes have their beauty and atmosphere greatly enhanced. The choice of diffuser may be left to individual taste: for portraits with a two to three-inch head, a one- or two-ply screen will probably be preferred, while for landscapes a three- or fourfold one may be used. A cardinal advantage of this method of diffusion is that, no matter how strong the negative, there will be no patches of pure black or pure white, and, although the outlines are not thrown out of focus, they assume a softness which, in the case of extreme diffusion, say with six folds of chiffon, approaches to what one might call "dreaminess."

As regards the effect on exposure, the particular quality of chiffon used by the writer is found to increase it by one-half to each thickness used, thus:—one, half more; two, double; three, one and a half times, and so on.—*Amateur Photographer.*

Fog—and How to Deal With It

WHEN a professional gets a fogged negative he can generally recognize the nature of the fog and put his finger on the cause. The young assistant, however, is apt to assume that all fog is caused by the action of light on the plate before or during development. He learns later, with surprise, that there are other kinds of fog which may occur even when the plate is handled in a perfectly safe light. He finds out that, besides ordinary light fog, there are atmospheric fog, chemical fog, and the peculiar form of chemical fog known as dichroic fog.

Atmospheric fog, as its name implies, is actually

present in the atmosphere, but it is often visible to the photographic plate when it is invisible to the eye. This happens whenever the moisture or dust in the air reflects ultra-violet and violet rays, instead of the rays belonging to other parts of the spectrum. And so it happens that a landscape, which the photographer thinks is free from all fog, may really be bathed in a thick invisible ultra-violet mist which is faithfully recorded on the plate. Distant mountains can often be plainly seen when it is impossible to photograph them on an ordinary plate without a light filter. The whole difficulty is very simply solved by the use of panchromatic plates and the appropriate light filter.

Chemical fog is of an entirely different nature. It is due to uncontrolled chemical action during development. The whole process of development is based upon the principle that the developer will reduce to metallic silver those particles of silver salt upon which the light has fallen; whereas the particles upon which the light has not fallen will remain unaffected by the developer. If a very strong developer is used, however, there is a danger that it will reduce the particles of silver salt, whether the light has fallen on them or not; and the metallic silver which is thus deposited evenly all over the plate is known as chemical fog.

It is sometimes said that chemical fog is due as much to the instability of the silver salts in the emulsion as it is to the strength of the developer. The emulsion of a modern dry plate, however, is seldom at fault—but the developer which suits one emulsion is not always suited to another. The wise professional sticks to the formula recommended by the makers of the plates which he uses. Even when he does so, he may get chemical fog if the developer is too warm, or if he forces development in any other way. Some plates will stand more heat than others without fogging; but it is a safe rule never to use a developer below 65° or above 70° F.

The established method of guarding against chemical fog is to add potassium bromide to the developing solution. It has been suggested that the bromide combines with the silver salts in the emulsion to form a double compound of silver, which does not respond so readily to the action of the developer; and that there is, accordingly, less risk of the developer reducing any particles of the silver salts upon which no light has fallen. This is only one theory out of many. Few subjects in photographic chemistry have aroused such fierce controversy as the part played by bromide in the developer. Mr. H. W. Bennett, F.R.P.S., goes so far as to say that without bromide fogging is inevitable and that absolutely nothing is gained by its omission. On the other hand, Mr. Alfred Watkins, F.R.P.S., states that bromide is a legacy from the days of pyro-ammonia and that its use introduces complications and variations without sufficient compensation.

Whichever view is right, the fact remains that potassium bromide, in small quantities, is an efficient protection against chemical fog; and, in larger quantities, is an efficient means of adding to the contrast and brilliance of the negative. For these very reasons many professionals, when aiming at soft portrait negatives, prefer to omit the

bromide from the developer altogether and avoid chemical fog by using a dilute solution.

The most curious fog of all is a peculiar form of chemical fog known popularly as green fog and scientifically as dichroic fog. It is found on negatives in the form of a stain, which is yellowish green by reflected light and reddish pink by transmitted light. This characteristic explains its scientific name—for dichroic fog means literally "the two-colored fog."

Its nature and its cause are not so easily explained. The general view is that dichroic fog is found only when some ingredient of the developer has the power of dissolving the silver salts in the emulsion. Silver bromide, silver chloride and silver iodide are all practically insoluble in water—but they are all easily soluble in ammonia or ordinary hypo, and are slightly soluble in sodium sulphite. And so this peculiar trouble was very common in the old days when nearly all plates were developed with pyro-ammonia; and it is still apt to occur when the developing solution contains hypo or an excess of sodium sulphite.

When the developer contains none of these solvents, the silver salts remain firmly embedded in the gelatin emulsion; but when any of these solvents are present, some particles of silver salt are dissolved out of the emulsion. If the salts react with the developing reagent while they are in this state of solution or semi-solution, the metallic silver is deposited on the surface of the plate in an extremely fine colloidal state. This deposit is what is known as dichroic fog. It is naturally heaviest in the shadows where there has been the least light action, because it is in these parts that the particles of unreduced silver salt are the most numerous.

The chief characteristic of dichroic fog is that it is entirely superficial, as distinct from chemical fog which is a deposit in the body of the gelatin emulsion. Indeed, dichroic fog may often be removed by simple friction, or by mechanical reduction, as it is called. Generally speaking, it is difficult to get rid of it. Sir William Abney, F.R.P.S. suggested bleaching the negative in a mixture of ferric chloride and potassium bromide and then washing it well and re-developing it with ferrous-oxalate. This method, however, does not really get rid of the fog: it only converts the green stain into a general gray fog which is not so visible. Probably the most effective treatment for dichroic fog is to put the negative through the following bath:

Sodium sulphite	1 oz.
Potassium cyanide	100 gr.
Distilled water	20 oz.

Troublesome as these three varieties of fog undoubtedly are, ordinary light fog causes still more trouble because it is so common. It is sometimes due to dark slides and dark rooms which are not light tight; but it is still more often due to the use of unsafe dark-room lamps.

Fortunately photographers are now recognizing more and more that they cannot rely on ordinary red, yellow or orange glass or paper to intercept the actinic rays. Many of the dark-room lamps which used to be sold gave barely enough light to make the darkness visible, and yet they transmitted such a large proportion of violet and blue

rays that any plate of moderate speed was almost certain to be fogged. These two improvements being based upon scientific principles have practically eliminated light fog from professional dark rooms.—*Professional Photographer*.

A Rapid Fixing Bath

IN a recent number of the *Photo-Revue* a French worker gives the following formula for preparing a stock bath allowing of the fixation of negatives and prints being done in the minimum of time:

Hypo, anhydrous (or, soda sulphite, crystals, 200 gm.)	100 gm.
Ammonium chloride	70 gm.
Potass. metabisulphite	10 gm.

Negatives are placed in a mixture of this stock bath 1 part, in water 4 parts. Papers are placed in a mixture, stock bath 1 part, water 9 parts, in which they are allowed to remain for from eight to ten minutes. The formula is recommended not only on account of its active and rapid fixing properties, but is said also to yield by-products of fixation which are more readily and rapidly removed by washing.

Overworking the Developer

PROFESSIONALS need reminding, in these days of economy, that they cannot keep down expenses by overworking their developers in bromide printing.

When a developer becomes too weak to do its work properly it should be discarded; otherwise washy, flat prints of unsatisfactory color are certain to be produced.

A certain quantity of developer will only develop satisfactorily a certain number of prints. Professionals who work on a large scale are apt to forget this. They use a fairly large quantity of solution, and work it as long as it will develop at all. The result is that a large number of their prints do not show the beautiful grays and black which their paper is capable of giving.

It is very tempting when things are going along smoothly to let them run as long as possible; but this feeling must not be allowed to carry you too far.—*Professional Photographer*.

Handling Undeveloped Plates

MANY operators have a habit of taking exposed plates out of the slides and putting them in a plate box until they are ready to develop. There is nothing wrong with the idea, but the way the plates are laid in the box makes a great difference. The first plate should always be placed in the box, glass side down. This prevents the emulsion side from coming in contact with any chemical dust or moisture that may have been taken up by the pulp board of which the box is made.

When you lay the first plate in the box glass side down, and the second plate glass side up, with nothing between the two, you bring the emulsion sides of the two plates together, and they will be perfectly safe until you are ready to develop them.

Traces of perspiration and chemical impurities are transferred from the fingers to the backs of plates during handling. These marks from

handling will do no harm if the emulsion sides of the plates are always packed together. But if the first plate is laid into a box emulsion side up, and the next plate the same way, the emulsion side of the first plate comes in contact with the finger marks on the glass side of the second plate and these marks are offset on the emulsion. When the plate is developed, the marks sometimes show as distinct finger prints and sometimes only as irregular opaque blotches. Bare hands never come in contact with either the glass or the emulsion side of a plate in manufacture or packing. The plate makers and packers wear clean gloves and they handle plates entirely by the edges. Plates are always packed in the boxes face to face and back to back.

Handle them the same way in your dark-room and you will not have any of your negatives ruined by finger marks.—*Photo Digest*.

The Height of the Camera

It is not sufficiently realized by some operators how much the height of the camera influences the expression and character of a portrait. When a sitter has been placed in the best position, and the lighting arranged to suit the particular type of face, there are still many modifications which can be made by tilting the camera upward or downward. These changes in the position of the camera alter the perspective of the lines of the face and body, and make a difference in the general appearance of the portrait.

Pose a sitter with his head quite level and his eyes fixed on something the same height as the camera. Now lower the camera and tilt it upward, and you will see that, although the sitter has not altered his position, the head appears thrown back and the eyes turned upward. Then raise the camera and tilt it downward, and you will see that the head appears bent forward, the forehead broader and the face more pointed toward the chin.

When you take a head-and-shoulders portrait of a small man with a large bald head, do not have the camera too high—unless you want to emphasize the fact that his head is out of proportion to his body and that his hair has disappeared. On the other hand, when you photograph a stout full-faced man with a receding forehead, do not have the camera too low—unless you want him to look more like one of our savage ancestors than a man of today.

Then again, in taking full or three-quarter length figures, you can make a sitter look shorter or taller by raising or lowering the camera. A high point of view will fore-shorten a figure and give a squattiness to the portrait. This should never be done unless a sitter is abnormally tall and thin. A low point of view will make a sitter look taller. It is extremely useful to remember this when you make portraits of sitters who are below the average height. As a rule, sitters are very sensitive on matters relating to their stature; so much so that very often proofs are accepted or rejected simply because they please, or fail to please, on this particular point.

When children playing on the floor are photographed from a high point of view the charm of the picture is often destroyed by the foreshorten-

ing of the figures. To avoid this the children can be placed upon a platform. But very few professional photographers nowadays will tolerate a cumbersome platform in their studios. The alternative method is to use a studio stand such as the Century Semi-Centennial, which allows the camera to be lowered to within fifteen inches of the floor.

These points in the manipulation of the camera become second nature to the careful operator who has made a close study of perspective and who applies this knowledge to his daily work.—*Photo Digest*.

Random Notes

WHEN clouds are imitated in working up the background of a sketch portrait, care should be taken to light them from the same direction as the portrait. The beginner is apt to work in an aimless fashion. He is too often content with cloud-like forms without noticing whether they help to balance the picture and produce a harmonious whole.

A MUDDY, lifeless bromide print can be considerably improved by one application of the chromium intensifier. This treatment adds to the depth of the print and turns the color into a fine rich black. The solution is made by dissolving 100 grains of potassium bichromate in 10 ounces of water, and then adding $3\frac{1}{2}$ drams of hydrochloric acid. After bleaching the print should be washed for five minutes, exposed to daylight, or strong artificial light, and re-developed with Dolmi.

WHEN matte prints have to be copied, they should first be thoroughly wetted and then squeegeed on to a sheet of clean glass. This helps to show up the detail in the shadows, and gives the prints the familiar rich appearance they have before they are dried. There is no danger of the prints sticking to the glass if they are not allowed to dry while in contact.

A GOOD method of hardening a negative film, so that it will withstand the wear and tear of a long run of prints, is to soak it in a bath made of alum, 4 ounces; tannic acid, 120 grains; water, 32 ounces. The negative should not be left in this solution for longer than four minutes; otherwise, it may become so hard that the film will crack and split at the edges. The solution will keep and can be used repeatedly.

MAGNESIUM ribbon is a good friend to the professional, especially during the winter months. It is very helpful in lighting up dark corners of interiors which otherwise might need hours of exposure to pick up the detail. It is helpful, too, in copying. About four inches of ribbon, burnt at two feet from the print, will give ample exposure for copying a cabinet, same size, with the lens at $f/8$. Care should be taken to keep the light outside the field of the lens during the exposure.

PLAIN magnesium powder differs very little from magnesium ribbon. The powder, of course

burns more rapidly and gives a more intense light. Where large volumes of light are needed, it is more convenient to handle than ribbon. Magnesium powder is simple and safe to use, but the flash is followed by considerable smoke, and an exposure of one-tenth of a second is about the shortest that can be given.

MAGNESIUM powder is usually burnt in a flash-lamp by blowing it through the flame. The air pressure is generally supplied by the familiar rubber bulb and tubing. The important fact to remember about all lamps intended for use with plain magnesium powder is that they must never be used with compound powders or flashlight mixtures. The reason for this is plain. Magnesium lamps provide for the storage of a quantity of powder near a flame. There is no danger in this because magnesium powder will not ignite very readily and must be blown through the flame before it will flash. Flashlight compounds, on the other hand, are all more or less explosive and must not be brought near a flame or any form of heat until the actual moment of making the flash. Flashlight compounds burn very rapidly, so rapidly, in fact, that the exposure is practically instantaneous.

SODIUM sulphite crystals can be dissolved very easily, if warm, not hot, water is used. The best way is to put the crystals in a muslin bag and suspend it in the water. The sulphite solution falls down as the crystals dissolve, and the remainder is constantly in contact with comparatively fresh water.—*Professional Photographer.*

PATENT NEWS

Under this heading it is proposed to include each month a list of all the U. S. Patents; and brief abstracts of the more important, and to include also such foreign patents as present special features.

Copies of any patent can be obtained from the Commissioner of Patents, Washington, D. C. Price, five cents each.

Camera. F. J. Wende. 1209239.
Camera Attachment. D. Palmer. 1209015.
Stereoscopic Cinematograph. J. Richards & L. J. E. Colardean. 1209498
Recording Colors. W. B. Featherstone. 1209420.
Photographic Device. H. D. Farquhar. 1209419.
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APRIL, 1917

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A WATER THERMOSTAT FOR MAINTAINING PHOTOGRAPHIC DEVELOPING SOLUTIONS AT CONSTANT TEMPERATURE ¹

BY ALFRED B. HITCHINS, Ph.D., F.R.P.S.,

AND

F. B. GILBERT

IN the determination of the speed and character of photographic emulsions, by the Hurter and Driffield system, it is customary to expose two strips of the plate to be tested and then develop them for times T^1 and T^2 . That is to say, one is developed twice as long as the other. The developing action must be even, with a minimum of fog, and above all things should be conducted at a known temperature that can be accurately controlled. It is important that the temperature of the developing solution should be the same day by day in order that tests can be made under strictly comparative conditions.

It is, of course, possible to maintain the temperature of developing solutions with reasonable accuracy by means of a large water-bath, the dishes containing the developing solutions being built in so that they are surrounded by the water in the bath. This method is, however, too cumbersome for scientific work. Any form of dish development means more or less handling of the strips, and considerable inconvenience may be experienced in the dim light of the dark-room in getting hold of the strips quickly when their times of development are up. Actual handling of the strips at any stage should be done away with as much as possible.

When T^1 and T^2 curves have been plotted they furnish figures which are used as the basis for calculating two

¹Communication from the Ansco Co.'s Research Laboratory.

of the most important characteristics of photographic emulsions, namely: gamma (the contrast) and K (the velocity constant). If we are to place any reliance upon these calculations, we must be assured that development has taken place at a constant and uniform temperature, and in order to insure our tests being developed at all times under strictly comparative conditions we must be able to duplicate and maintain the chosen temperature day by day.

It is for this purpose that we have designed a special form of thermostat for the development of the H & D plate strips. The instrument used is a modification of the Freas water thermostat. This instrument is very reliable and will maintain a large body of water at constant temperature day in and day out without attention. The instrument can be set for any desired temperature between 15° to 50° C., and when once adjusted will not vary $\frac{1}{5000}$ of a degree plus or minus.

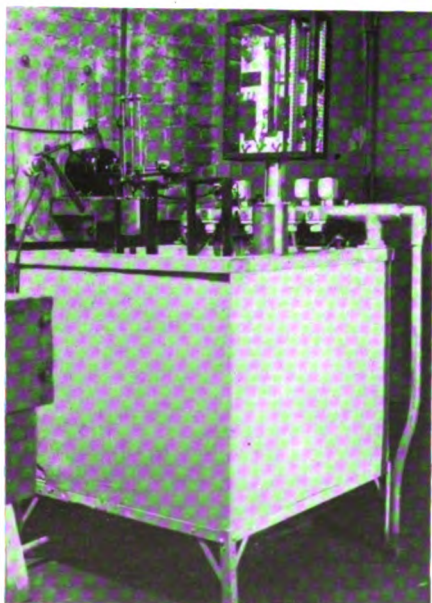


FIG. 1

Fig. 1 shows a complete view of the thermostat with the developing machinery mounted on it. There is a large tank, having a capacity of 340 litres of water, with inside measurements 28 x 28 x 30

inches deep, equipped with a stirring device and a mercury regulator which controls the electric heaters through a thermal relay. The regulator and heaters are shown in Fig. 2; hot-point electric heaters are used as the source of heat.



FIG. 2

There are five electric circuits provided, and all can be used where high temperatures are desired; but in photographic work, where a low temperature is used, only two circuits are utilized in heating the water—the primary and the secondary heater—the other circuits being used for the dark-room lamp over the instrument and the motor for rotating the agitating mechanism. The primary heater is always dependent on the thermal relay contactors, as determined by the mercury of the control tube. The secondary heater, if on the first switch, is furnishing heat continuously; if on the second switch, it is also operated by the mercury control and furnishes intermittent heat; if operating on the third switch, the secondary heater is in series with the room temperature control contactor and the mercury relay contactor; thus, if the room grows cold, this heat will be added to the intermittent heat of the primary heater.

There are also devices provided for maintaining the water at constant level and for cooling the water in the tank when the room temperature is too great. The tank is thoroughly insulated to avoid effects of sudden changes of room temperature. The water in the tank is kept from stagnation by a small continuous inflow of water. A small cock over a

sponge-filter is provided. This is left open so as to give a drop or two of water per second.

Naturally such a large volume as 340 litres of water furnishes a great thermal capacity. Hence changes in the room temperature affect the bath so slowly that the thermal mechanism has ample time to act in order to prevent variation in the constant temperature desired. The water is kept thoroughly agitated by a continuous-running motor operating on a propeller shaft. The motor is on a separate stand and is slung on adjustable springs, thus there is no vibratory noise or vibration to cause false "makes and breaks" of the electrical contacts. The thermal relay works noiselessly, while all magnetic relays continuously chatter. The mercury control tube holds about sixteen pounds of mercury; this large quantity produces extreme sensitiveness. When the temperature of the water rises above that for which the regulator is set, the mercury of the control tube makes electrical contact with a nickel needle point; the current passes through the

of the thermal relay is that it never sticks, which all magnetic relays will do sooner or later, thereby spoiling experimental work.

Fig. 3 shows in detail the control boards. The larger panel takes care of variation in the temperature of the hydrant supply; the smaller panel compensates for changes in the room temperature. The relay contactors and also the room contactors are bridged by condensers to prevent arcing, and the thermal relay, because of the absence of an induced current, gives only a very small kick spark at the break at the mercury surface. If the room greatly exceeds the temperature it is desired to maintain in the tank, water coils in the bottom of the bath can be opened and cold water circulated through them. Enough water is passed through to hold the temperature slightly below that desired, allowing the heaters to bring the bath back to the accurate temperature required.

It was only after a great deal of experimenting and building of different devices that we succeeded in designing an apparatus which would with satisfaction mechanically develop the strips. The rate and method of bringing the developing solution in contact with the plates are factors which will cause decided variation in the results obtained.

In connection with the various methods of mechanically agitating developing solutions, there are several points to be considered. The most important are:—

1. Even development, *i. e.*, the developed strips must be free from development markings due to uneven action of the solution.
2. The method must not induce fog.
3. It must be possible to remove one or more plates quickly from the developer without handling with the fingers.
4. The results obtained must be uniform.

There are two possible ways of keeping developing solutions in motion over the surface of the plate. One is to move the plate, and the other to move the developer. The first method can be applied successfully by revolving the plate around its longitudinal axis, and (provid-

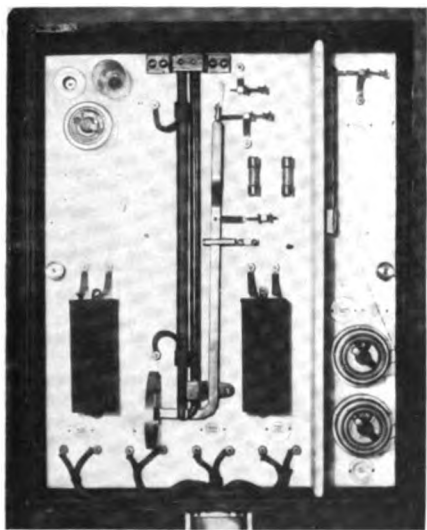


FIG. 3

thermal relay and breaks the heating circuit without sparking. The thermal relay is operated by the heating current used, so that batteries, which are always a source of trouble for continuous duty, are not required. The great advantage

ing the plate is rotated in a narrow cup but little larger in diameter than the width of the strip) very even development is obtained, but this method precludes the possibility of developing at the most more than two strips in one cup; and in a large laboratory devoted to testing the character of photographic emulsions it is frequently desirable to develop at least six or eight strips at the same time. We found that revolving the strips in a large bath of developer, such as would accommodate the number mentioned, invariably produced development markings, especially on short development. These markings generally took the form of a symmetrical design, usually an S-shaped or 8-shaped figure, and would appear regardless of the speed of rotation. Speeds varying from ten to sixty revolutions per minute were tried. Furthermore, it was found that in many cases one side of the strip showed a higher fog than the other.

The next scheme was to cause the strips to travel around the circumference of the bath, facing the direction of motion. Uniform and even development were acquired by this method, but the pressure of the developer on the faces of the strips produced excessive fog. This system is subject to the same objections as all methods where the plate itself is moved. There is always more or less difficulty in removing the strips when the time of development is up, unless the mechanism is stopped or at least made to move more slowly.

These methods having proved unsuccessful, it was decided to abandon the plan of moving the strips and take the alternative of agitating the developer. From previous failures we had learned that in bringing fresh developer in contact with the plate, it must be done in an even, gentle manner. There must be no streams flowing against the plates with a greater pressure than the rest of the developing solution, or markings of greater density are produced locally; furthermore, the agitation as a whole must not be too powerful, however uniform it may be, or high fog results. With these points in mind the developing mechanism to be described was designed.

Fig. 4 shows a close view of the mech-

anism. It consists of two concentric cylinders, the smaller being about two inches in diameter, and the larger four inches. The inner cylinder contains the agitating mechanism, which is merely three multiblade propellers fitting closely to the walls of the cylinder, and situated one near the bottom, one at the middle, and the other near the top of the cylinder.

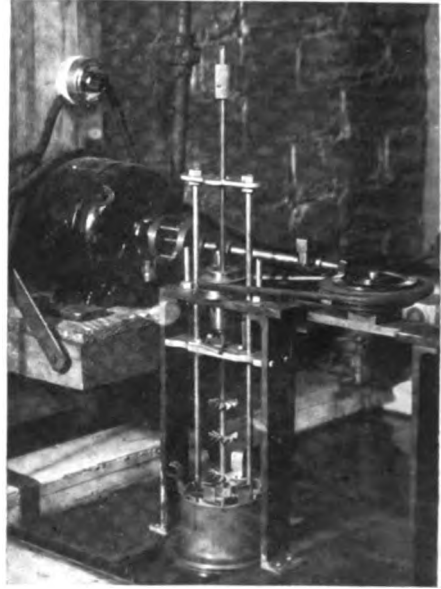


FIG. 4

When these propellers are in motion they pull a steady stream of developer from the bottom of the developing cup up through the inner cylinder and discharge it over the top, at the same time giving it a gentle swirl as it goes over, thus affording a very thorough mixing of the oxidized with the fresh developer and producing a constant and even circulation of the solution, which is uniform in its action on the whole inner surface of the outer cylinder on which the strips are hung. The plate-strips are held in little carriers, which fit into grooves arranged around the inner periphery of the outer cylinder. Grooves for eight strips are provided, forming an octagon. The holders have small handles, which project up out of the developing cup, and by which they may be seized, one or more at a time, and removed from the developer

and plunged into the hypo or stop bath without any unnecessary handling. The outer and inner cylinders are connected together by struts at the top and bottom, and the whole is suspended from two guide-rods which slide through the framework and serve to lift the cylinders out of the developing cup for loading. The propellers are on the central shaft and also slide in and out of the cup. The shaft is driven by the gearing shown, and the number of revolutions per minute can be varied to suit any conditions. The developing cup which contains the developer is hung through the hole in the bed-plate. All parts of the machine that come in contact with the developer are heavily nickel-plated. The back part of the thermostat tank is used to store bottles of stock solution, so that they may always be at practically the right temperature for use. The developing cup, which is made of brass and heavily nicked, is also kept in the bath, to ensure it being maintained at the desired temperature.

In practice the machine is used as follows: The cylindrical framework supporting the plate strip-holders is withdrawn from the developing cup, the necessary amount of developer drawn from the bottles, mixed and diluted to

the working strength, and poured into the cup. The agitating mechanism is then dropped in and set in motion. This is allowed to continue for a little while to bring about an adjustment to the developing temperature of all the parts of the apparatus. White lights are then extinguished and the cylinders lifted from the cup and quickly loaded with the strips. Then, the time being noted, the whole is slid down into the developer. As the required development periods elapse, the strips are withdrawn and placed directly in the fixing-bath. The usual fogs obtained on Ansco negative emulsions of about 180 H & D are .050 and .090 with three minutes' and six minutes' development respectively, using pyro-soda developer without potassium bromide. The same emulsions developed in a dish with every care give fogs of .072 and .116. Using standard emulsion, specially coated upon parallel plane plate-glass, we have been able to repeatedly check the calculated gamma and velocity constant K, of an emulsion, and subsequent measurements taken over the entire surface of plate strips that had been flashed, and then developed to a uniform gray, prove that the method adopted is almost ideal in its production of evenly developed strips.

ENLARGEMENTS AS A SOURCE OF EXTRA PROFIT

BY L. G. COOVER

YOU want to make more money. I will point the way—a tried and proved way—but you'll have to pedal yourself along, for there is no road over which runs a free bus. You must walk, and you must bend your back to gather the shekels. Perhaps you need to make more, but you'll never do it or be able to do it unless you really want to make more. If you have that determination, you can and you will, for I'm going to propose how you can—a way, as I said, which is tried and proved.

Make enlargements; don't wait for customers to ask for them, as you have been doing, but get busy and ask them to have them made. How many have you made in the last year? Perhaps twenty-five at the outside. Well, you should have made enlargements for two-thirds of your sitters. Now, don't stop reading here, thinking this is some preposterous dream—it isn't; it is an exposition of a practical studio system whereby two-thirds of your sitters can be sold an enlargement where none were sold before. I will merely

point out your greatest oversight in your past conduct of business.

As a basis of calculation, we will presume you do an average business of seven hundred and fifty sittings yearly—two-thirds of that would be five hundred—so now we have the number of sitters who would buy enlargements. You could sell at least one 8 x 10. On that your profit would be no less than fifty cents; on your 11 x 14's and 14 x 17's, which are the three sizes I am pleading for, you would turn an average of a dollar.

Based on experience and thorough inquiry, it is safe to say, considering the number of patrons who will order more than one 8 x 10, and the number of larger sizes, your profit per customer will run some little better than seventy-five cents. I'm working with conservative figures, too, so that at the end of the year you will have in the neighborhood of \$400 clear profit—velvet, as it were—and certainly you could use those few hundreds. Well, get busy and get it, and more than four hundred—all depending on your volume of business and your surplus energy.

It will cost you but very little to prepare for the work—there are dozens of inexpensive yet withal practical ways of equipment; so I will not in this article discuss the working end of it. My argument is simply for the selling possibilities of enlargements and the extra profit in sequence.

Prepare some samples, and I suggest doing it in portfolio form. On one page mount a contact cabinet print, on the opposite page an 8 x 10 enlargement, a few 10 x 12 to 11 x 14, or a panel 7 x 11—some black, some sepia. Have a little variety of papers, textures, etc. Use some buff papers—artist-proof a few—wax them when desirable. Frame a few.

Now, right here is a good place to dispel a certain notion or prejudice you may hold for enlargements—bromides. You are probably right now confounding the average bromide—generally a crude, coarse, dirty, smudgy, obviously enlarged bromidery bromide—with the possibilities and beauties of a well-executed enlargement, and so I want to bear on this phase of the question for a paragraph or two.

I'm free to admit that nine out of ten bromides are a visual crime against photographic standards, and I'll tell you why. They are enlarged too much, far too much, and generally by a more or less incompetent worker so far as portraiture is concerned. If kept within a certain limit of enlargement, and quality for quality, there should be a gain, an enhancement of effect. I make this as an unqualified statement. I know of no one who is delivering a more perfect print in point of either technical or artistic excellence than Frances B. Johnston, of New York, and her chief selling argument is a comparison of a contact print and a properly enlarged print, and invariably the customer selects the enlarged process print, for it has atmosphere. I could go on and name a dozen Fifth Avenue photographers who are enlarging from choice.

If you will hold your 5 x 7 negatives within certain limits of enlargement you need harbor no fear of the quality of your work; to the contrary, you may anticipate many a little surprise over added quality and little touches of charm to many of your pet negatives when they are run up in size.

If you can make a good Artura, or Cyco print, if your standard of results is for the best possible, you can make as good a print by the throwing-up route as any of the really good, though unfortunately few, bromide enlargers.

The cost of production, so far as material is concerned, is practically the same as Artura or Cyco; in fact, some magnificent result can be had by using the papers mentioned, though they are rather too slow to advise for every-day use. Chemical manipulation is virtually the same in bromide work as in the developing papers for contact work. True, you cannot work quite as fast, yet you can turn out a number sufficient to make a big day's profit on your labor and skill.

Your loss is slight if you use judgment; but, by all means, when you see a chance to noticeably improve a print by making it over, do so. The better your prints are today, the better will be your patronage tomorrow.

I don't know why enlarging is such a

bugaboo. Certainly nothing could be more simple for anyone with a photographic knowledge to understand.

No one that I know of ever tried it and failed—that is, if he had the ability to do other things well. If you have ability, you can do bromides; if you know results, quality results, you can obtain them on the enlarging screen just as readily as by printing in contact.

Again, I want to repeat the admonition: Don't enlarge too much; don't starve quality for size—it isn't necessary. A 5 x 7 will enlarge in all cases to 11 x 14, and be the better for it. Most good negatives will go to 14 x 17 if judgment is used as to paper texture; on rough papers 16 x 20 will retain all the quality of negative. Up to those sizes you're safe. Beyond those you will encounter a fast falling-off in quality. I dwell upon this point in working because it is essential to my suggestion. When I suggest enlargements for profit, I have in mind the best. I said I wouldn't write of the working part, but as I get into it I find I can't pass over that mistake in the working end without warning you of it.

Now that I've tried to prove to you that you yourself can produce good enlargements, I want to strongly advise you against the other prerogatives. Do not send your negatives outside for enlarging; if you do, you will waste your profit and lose your calm of temper before the year dies. This plan is practically useless unless you carry it out yourself.

Now to go back to the selling end of it. Make ready your samples, and work with the idea that this enlargement departure is just as much as part of your sale end as are your efforts to talk the patron into ordering a dozen prints rather than a half-dozen.

Show these samples to every sitter—talk them—suggest enlargements. I don't care what sitter you select, there is a premise to conclude they will want and buy an enlargement—one or more. There are the babies. You will find it the easiest thing in the world to dispose of a couple of 8 x 10's. Suggest a couple to be given the grandparents. And children are easy, too. Figure out a scheme to give a little better, and an 8 x 10 for \$5 instead of \$4, regular price.

The young lady has her beau. Suggest a 10 x 12 or 11 x 14 for him. The young man has a sweetheart. Why not a larger one for her? The husband and wife have one another and their aged parents—a chance for two large prints!—and the old folks have their grown-up children. Every sitter is a prospect; each one has some relative, someone dear to them, to whom they will, no doubt, be glad, even anxious, to give a better portrait if they can do so at a reasonable expense.

Put in a line of stock frames to fit the standard sizes; arrange with a local framer to furnish you moulding samples, and sell on per cent. You may know of some very clever colorist, rather artist, with whom you could arrange to color many of your enlargements.

Bridal couples are always certain. Enlargements on speculation will sell at least 50 per cent.—the ones left are always good samples. Larger prints in your display-case are seen from a greater distance, and more than one person will be attracted from across the street.

It will cut down your plate bill so far as speculative sittings and showcase samples are concerned.

When you don't get a direct order, watch the speculative end thoroughly. Tell the sitter how satisfied you are that a certain negative will enlarge handsomely; that you are going to make it up on speculation. Give them something for their curiosity and desire to grow upon. Don't dismiss a customer, and always have your speculation print ready by the time the order is.

I want to give a little example in regulation dollars and cents of the enlargement advantage.

First, presume you are not prepared to do enlargements. You are talking prices to, say, a bride and groom; they inquire about prices—for instance, two dozen cabinets. You answer, \$10. They point to some 8 x 10's—\$15 a dozen, we'll say. Half a dozen would be how much? Ten dollars, you answer. "And a large one"—pointing to a 11 x 14. You ask at least \$6 for one—duplicates, \$3 each. They quickly figure it all up—\$26 total. Too much, they conclude, so they only sit for the cabinets. And yet you gave them the most reasonable price you could.

When they ordered from their proofs, you probably secured about a \$12 order.

On the other hand, had you been prepared to enlarge, you could have consistently priced the 8 x 10's at from a \$1 each for the same thing you asked \$10 for six up to \$1.50 each for something unusually well mounted, for the 11 x 14 from \$2 to \$3 would be a very good price, and at these prices you can generally secure such an order from bridal groups. You are catching extra business and giving the customers what they want for what they can afford to pay.

Where is the business logic in *trying* to get a \$25 order if it wouldn't turn you any more profit, perhaps not as much, as an \$18 or \$20 easily secured, just because of the \$5 to \$7 difference to the customer?

In a plain spirit of fairness, you owe your patrons something; in fact, any business endures longest that owes its patron the most.

You haven't so many sittings per week but what a day's time would clear up an enlargement or two from every negative made during the week. If you do it yourself, so much the better. There is no process so fascinating as enlarging. If you are a heart-and-soul photographer, you'll forget to eat. No process has the same latitude of manipulation. You can go into your bromide department with your pet negatives and do just those things you want done to them. You'll revel in it, and you'll be making money, too. Not a bad way to spend a day, is it? Or, if you have the right sort of printer, it will be a happier day for him than pay-day. Don't grow afraid you can't hold up quality to your work. Do as I suggest, and you'll improve the general quality of your output. You'll commence to appreciate photography; little subtle qualities will unfold themselves day after day, and a year later you'll notice the most marked improvement in your work that any year has ever before shown. And—mark this well—it means more profit: hundreds more.

People like and want larger pictures, not necessarily 20 x 24's—that's an insane custom; they want them and will

buy them if you will put them within their reach. But you know as well as I do that your average patron cannot afford any \$5 to \$15 for a large print. Very few people would own their own homes if they had to buy two-acre tracts.

There is no magic about the bromide process; it does not require a genius of talent or ability to manipulate it. If you count yourself a good photographer, you can do as well enlarging. That's the working end of it.

Now to the business end—it means quite a little more profit to you. Studios conducted along good business lines are doing it. I haven't proposed anything but what any well-equipped studio has, and should have, and, having it, they should use it.

You think me impertinent about it. Well, I know most of you photographers. If I thought another strain of writing would wake you up, I'd employ it for your own good. We're a rather indolent, procrastinating bunch—a good many of us think we're artists, when we ought to get busy and be business men first, and let our art side develop along with our prosperity. And, by the way, here's a little thought for you to think over.

You're probably not the only photographer in your town—probably not the only reader of the JOURNAL. He may read this article and follow it up. See, I'm just playing one against the other. Don't let him get the bulge on you; don't let it be possible for people to come in and inquire whether you make enlargements like the other fellow does. It is going to hurt the man who doesn't, and it will help you both if you do.

And so, right now let this resolution take root in your mind: *Resolved*, That I will attend to having an enlarging equipment installed; that I'll have this extra profit I've so long neglected. You no doubt have dozens of articles on the *modus operandi* of enlarging. Dig into your magazines and get them out and read up. Then put in your equipment, use your head when you work, and you'll soon be making extra dollars.



BY ALICE BOUGHTON
NEW YORK



PORTRAITURE

By A. C. R.

PORTRAITURE, you will grant, is by far the most difficult branch of our art. Take any other subject as a subject for the camera, and with sufficient technical knowledge the obstacles are by no means insurmountable; but what else in creation can compare with the human countenance for mutability and variety of change? Health, temper, frame of mind, and dress are but a few of the contending difficulties which meet the professional photographer, for to combine a pleasing portrait with a true likeness must be our end and aim. As our subjects are seldom perfect, it is necessary to keep constantly before our mental vision a distinctly ideal form, so that when deformity presents itself, or even a single deviation from our idea of perfection in the human form divine, we may be able to discreetly modify the defect by the various means at our disposal without entirely obliterating any point which may tend to spoil the individuality of our sitter, and so attempt a deceit which is a distinct violation of the rules of true portraiture.

I think that most of us are cognizant how very unmerciful photography at times is apt to be; but if we can only bring our artistic knowledge to bear upon the difficulty, it is often more easily solved than we should imagine.

Shall we look for a few moments at the different points of the face, remarking, first of all, on the mouth?

This is, perhaps, the feature, especially in ladies, which requires the most careful observation, and on no account should the mind of the subject be influenced to the consideration of it, or a total destruction of the natural lines will probably be the result. Much may be learned from a cursory conversation with a sitter, during which an opportunity is gained of observing the delineation of the mouth when in animation or repose. In many instances the youthful female mouth may be treated with the lips apart, but in this case a full illumination of the opening is necessary, as

the tendency in photography is to obtain too dense a shadow, thereby destroying the delicate transparency that we admire in nature. Children's mouths are a fascinating study, with their beautiful, soft, mobile lines, full of a sweetness and repose seldom or ever to be found out of childhood. Unfortunately for photographers, however, this ideal expression is not the one most generally appreciated by the loving mother or auntie who may accompany the juvenile sitter, and a grin which distorts the bow-like mouth into a grin extending from ear to ear is more likely to meet with their favor. With advancing years the susceptibility of the mouth to change is more apparent than in any other feature. The development of characteristics, the results of certain habits, the circumstances of joy or sorrow, all tend to leave an indelible mark upon this most tell-tale feature, leaving compression of lips, and destroying with lines and twists the delicate mobility of youth. All this calls for our careful consideration in portraiture, and demands our utmost skill in dealing with it. For instance, a twist may often be modified by a judicious pose of the head, and I shall make a reference later on to the treatment of lines.

And now to pass on to the most attractive feature of the human visage, which is indisputably the eye.

Again I must revert to the child. Here we find the eye abnormally large, a fact accounted for by the growth of that organ not being in accordance with the other features. Both in children and adults this charming feature cannot receive too much attention, for here you have to deal with the "windows of the soul." All our most interesting subjects have fine eyes. While on this subject it is useful to remember that a certain latitude is allowed in the higher art of painting with regard to the size of the eye. But this is not a concession that we can apply to the photographic art. There are, however, certain conditions in our practice which tend to an opposite

YVETTE
GVILBERT
1916



By ALICE BOUGHTON
NEW YORK



result, unless we are on our guard, among which I may mention the indiscriminate use of light as being the most guilty factor, and it should always be borne in mind that too much light has the effect of dwarfing the eye. Stray lights are also detrimental, and are frequently caused by the mischievous use of white reflectors placed in too close proximity to the sitter. The seat of sweet feminine character is in the outer corner of the eye, and more particularly on the lower lid. Our greatest portrait painters fully recognized the importance of this most telling feature, for when receiving or parting with their subjects the eye was always the first and last to attract their attention.

We have now dealt with the two leading points of the face wherein mainly rests the expression, and the treatment of the other features—viz., the nose, chin, and ears—must depend on the judicious points of vantage which can only be selected by the photographer after a study of the contour of his sitter's head. The ugliness of a face may be decidedly modified by choosing either full, three-quarter, or side view, and the calling into requisition of the charm of light and the mystery of shadow, remembering that the naked truth is deceitful.

But one of the photographer's most serious barriers in the way of artistic effect is the constant contending with ugly fashions, the sleeve not infrequently proving a most troublesome point, its shape and size influencing in a large degree the scale of the head. The large, full sleeve, which, I regret to say, has become a thing of the past, was, in my opinion, admirably adapted for the square bust portrait, although it certainly had the disadvantage of emphasizing the defects in short, stout figures when full-length pictures were required. The present style of sleeve calls for special treatment, and only in exceptional cases is becoming. The arm usually emerges from a tuft of satin or other stiff material, about the size of a breakfast roll, and in bust portraits the short piece of arm which appears between the fulness of the sleeve and the lower margin of the picture seldom looks well.

But these and other vagaries of fashion are good tests for the photographer's powers of composition.

Children make delightful pictures, their simplicity and serene unconsciousness being qualities which lend themselves readily to the painter's brush, or the less pretentious camera; but to do them justice, in either painting or photography, needs a special study and love of infantile life. Reynolds was a great lover of children, otherwise our eyes could never have feasted on such art treasures as Lady Smith and her children, and many others.

His child models were, however, invariably well dressed, and here, again, as in adults, the photographer is met with a blank wall of opposition. A new stiff or starched dress is a garment usually brought into requisition for the important occasion, when an old, soiled, or flimsy frock would doubtless have been the very thing could the unhappy photographer have made his own selection. In the case of very young children the neck and shoulders should always appear, although there is a danger of making the head abnormally large, unless discrimination is used in allowing the dress to fall below the shoulders, thereby giving the appearance of greater width.

If the usual short frock is used, nothing is prettier for a child than a full-length figure standing alone, especially if taken from a low elevation, which gives the little subject dignity, and shows to advantage the limbs, which are always interesting; but this is doubtless the most difficult portrait to secure with any amount of success. The charm of our daily work with children is the constant anticipation of what may next reveal itself.

I will conclude with a few words as to the practice of retouching. As in landscape work, so in portraiture, we get too much detail; but, while not for one moment losing sight of the fact that all the predominant darks in the face are conducive to likeness, yet the excessive details which make their appearance on the intervening spaces can bear modification, as such detail is only troublesome to the eye, and not of service as regards

the likeness; but when the retoucher directs his energies to the wholesale removal of the darks, then the likeness at once begins to suffer. You remember

my reference to the seat of sweetness in the female eye, and if the fulness under it is removed, with it goes all the poetry.

HOW TO MAKE PHOTOGRAPHS FOR HALF-TONE REPRODUCTION¹

PICTURES were the primitive man's first attempt at recording his impressions or transmitting his ideas. Now, after the lapse of centuries, pictures are again the essential for the quick conveying of ideas to those whose fleeting attention must be attracted favorably.

The first primitive pictures were primarily "idea signs." Estheticism was no part of man's mental equipment. He simply wanted to "get an idea across." Buyers of illustrations for advertising would do well to keep that thought in mind.

In the great mass of advertising carrying "pictures" the individual advertisement must have more than a picture. It must be *illustrative*. There's a difference.

Merely pretty "pictures" are too common. What is wanted is an illustration which *illustrates* the selling points of the article advertised or the advantages of its possession to the prospective buyer in profit, convenience, or comfort. It must put the idea across.

Such illustrations can either be drawn by an artist or be photographed. There has been much discussion pro and con about the comparative merits of drawings and photographs. It would be apart from our present purpose to go into that discussion here. Suffice it to say that the best photograph is not equal to the best work of an artist, but a good photograph is superior to a poor drawing. In some classes of subjects, machinery for instance, a combination of the two, a good photograph with some art work, gives best results.

The purpose of advertising is to sell

¹ From "Etchings," house-organ of Gatchel & Manning, Philadelphia.

goods. The value of an illustration in an advertisement is measured by the extent to which it helps to do this. Advertising space is expensive. Catalogs and booklets cost money. The photograph, therefore, which helps to produce results is the only one worth while. The cost is secondary to accomplishment, and we might remark in passing that "cheap" photographs are generally the most expensive in the end.

It may seem a wholly superfluous bit of advice, but it is usually best to have your photographs made by a photographer. Some buyers have the head office-boy or the stenographer's brother-in-law or some other proud possessor of a hand-camera take snapshots. "It's a whole lot cheaper than paying two or three dollars per negative to that pirate of a commercial photographer down the street." We cannot emphasize too strongly this one great big fact, that the best photographs are generally the least expensive for reproductive purposes.

Photographing of Machinery

The quality of a photograph, as determined by the precautions previously taken, governs the amount of retouching needed to prepare it for a first-class reproduction. The cost of retouching is entirely a matter of artist's time. It is economy, therefore, to pay such attention to the preliminary work as will reduce this cost.

Generally speaking, the photographer is working at a disadvantage when making negatives of machinery: The lighting is seldom good; room is at a premium; it is difficult to get correct perspective and freedom from distortion. If a competent photographer is "on the job,"

these troubles will be avoided or at least minimized. The artist's work then will be limited to the adding of proper light and shade effects and the giving of greater definition to the detail; but no amount of retouching (short of practically redrawing the subject) will make a first-class piece of work on a photograph if the verticals are not parallel or the pulleys or large flywheels in the foreground are distorted.

False perspective is generally due to the camera being placed too close to the object, the result being that the parts nearest the camera are relatively too large compared to those in the rear. In addition, these parts so enlarged hide detail which would be visible viewed from the proper distance.

The vision of the normal eye is about sixty degrees. That is to say, the eye sees naturally whatever is included within that angle. The most natural-looking photograph, therefore, will be one which appears to the eye the same as though viewed from a point at a distance equal to twice the greatest length of the machine. Vertical distortion, in which the lines converge toward the top or bottom, is due to the ground-glass not being parallel with the vertical lines of the machine. If the machine is tipped up, then the ground-glass must be swung parallel to the then vertical line.

These things properly lie within the sphere of the photographer, and if he knows his business will be taken care of; but there are other points to be noted, little things, perhaps, but they figure largely in subsequent cost of handling.

The camera sees things that the eye does not notice: Defects in castings, barely perceptible to the eye on close scrutiny, loom up on a photograph; oil-spots or other discolorations appear much stronger than to the eye. Should these defects show on a large casting or frame of a machine it would necessitate the painting over of the entire surface, and if there were a number of bosses or ribs or a quantity of detail on parts of it the expense incurred in remedying the trouble would be very considerable.

Much unnecessary expense is incurred sometimes by sheer carelessness in not having all the working parts of the

machine properly adjusted in the desired positions. They have to be redrawn on the photograph, which takes time and skill. This means money. It frequently happens that the background is not sufficiently screened off with white cloths, and various foreign objects are in line with the camera and not only have to be removed but sometimes are confused with the details of the machine.

Castings should not be shellacked or varnished. Wherever possible, they should be painted a dull, lusterless gray.

Glassware, whether "etched" or "cut," presents peculiar difficulties in photography. The chief obstacle to be overcome is the "flatness" which is a characteristic of many photographs of such subjects, more especially when an effort has been made to get sharp detail.

The remedy for this trouble, and most others, with these subjects, is to photograph the subjects in a diffused light at an angle between forty-five and sixty degrees—being careful not to have them overtired. The "timing" with glassware is important.

Jewelry. In a general way, the same rules govern the handling of jewelry as given for glassware—diffused light and accurate timing. As most subjects of this kind are photographed arranged in groups for pages, with a cardboard or other background, the proper relief can be had by giving careful attention to the depth of the shadows and the angle of the light.

Color Engravings. Photographs as a basis for color engravings should have no sparkling or bright high-lights. The lighting, developing, and printing should aim at a finished soft-gray print with plenty of definition. A strong "contrasty" picture will almost inevitably, in the usual course of handling, become more "contrasty" in the finished plates. With soft gray effects in black-and-white prints a wide range of manipulation is possible in the re-photographing and etching. Prints of a sepia tone are less desirable on account of the poor reproduction quality of this color.

These hints are for the benefit of those not in a position to avail themselves of the services of a competent and experienced commercial photographer.

THE FUTURE OF PICTORIAL PHOTOGRAPHY

By ALVIN LANGDON COBURN

AN artist is a man who tries to express the inexpressible. He struggles and suffers, knowing that he can never realize his most perfect ideal. Occasional moments of ecstasy lure him on, but nothing is final in art; it is always progressing and advancing, as man's intelligence expands in the light of more perfect knowledge of himself and the universe.

It is this progress of the arts that has interested me. Where is it leading us? There are the "moderns" in painting, in music, and in literature. What would our grandfathers have said of the work of Matisse, Stravinsky and Gertrude Stein? What *do* our grandfathers say? They hold up their hands in horror; they show their bad manners by scoffing and jeering at something they are too antiquated to understand. It is the revolutionary of today, however, who is the "classic" of tomorrow; there is no escaping the ruthless forward march of time.

Yes, if we are alive to the spirit of our time it is these moderns who interest us. They are striving, reaching out toward the future, analyzing the mossy structure of the past, and building afresh, in color and sound and grammatical construction, the scintillating vision of their minds; and being interested particularly in photography, it has occurred to me, why should not the camera also throw off the shackles or conventional representation and attempt something fresh and untried? Why should not its subtle rapidity be utilized to study movement? Why not repeated successive exposures of an object in motion on the same plate? Why should not perspective be studied from angles hitherto neglected or unobserved? Why, I ask you earnestly, need we go on making commonplace little exposures of subjects that may be sorted into groups of landscapes, portraits, and figure studies? Think of the joy of doing something which it would be impossible to classify, or to

tell which was the top and which the bottom!

In last year's exhibition of the Royal Photographic Society there was a little group of prints by American workers, mostly entitled "Design"—many of my readers will remember them. They were groups of various objects photographed because of their shape and color value, and with no thought of their sentimental associations. There were, I believe, tables, golf clubs, portfolios, etc. The idea was to be as abstract as it is possible to be with the camera. Max Weber, the Cubist painter-poet, was responsible for the idea of these designs, and Weber is one of the most sincere artists that it has ever been my good fortune to meet; but of course these experiments in a new direction only met with sneers and laughter—it is always the same with an innovation in any direction. In his new book, *Essays on Art*, Weber says: "To express moods that stir the emotion from within, as does music, the plastic artist, when he conceives of energetic rhythmic interlaced forms or units, should be much more moved than even by music. It is like cementing a thought, or arresting a perfect moment of time, or like giving body to space, or solidity to air, or colored light to darkness."

How many of us are moved like this in photography? We think of the camera as a rather material means of self-expression—if we think about it at all; but is it really so? Pause for a moment and consider the mysterious quality of light registering itself in sensitized gelatin—all the scientific poetry in the words "latent image." In the days when men were burned at the stake for practising "black magic" the photographer would have been an undoubted victim if it had been invented in those dark times; but now every "nipper" has a "Browniek," and a photograph is as common as a box of matches—perhaps even more so,

this being war time! Photography is too easy in a superficial way, and in consequence is treated slightly by people who ought to know better. One does not consider music an inferior art simply because little Mary can play a scale. What we need in photography is more sincerity, more respect for our medium, and less respect for its decayed conventions.

All the summer I have been painting, and so I can come back to photography with a more or less fresh viewpoint, and it makes me want to shout, "Wake up!" to many of my photographic colleagues. "Do something outrageously bad if you like, but let it be freshly seen." If we go on fishing out our old negatives and making a few feeble prints of them, just as we have been doing for the past ten years, photography will stagnate. I have the very greatest respect for photography as a means of personal expression, and I want to see it alive to the spirit of progress; if it is not possible to be "modern" with the newest of all the arts, we had better bury our black boxes, and go back to scratching with a sharp bone in the manner of our remote Darwinian ancestors. I do not think that we have begun to even realize the possibilities of the camera. The beauty of design displayed by the microscope seems to me

a wonderful field to explore from the purely pictorial point of view, the use of prisms for the splitting of images into segments has been very slightly experimented with, and multiple exposures on the same plate—outside of the childish fakes of the so-called "spirit photographs"—have been neglected almost entirely.

As a start I suggest that an exhibition be organized of "Abstract Photography;" that in the entry form it be distinctly stated that no work will be admitted in which the interest of the subject matter is greater than the appreciation of the extraordinary. A sense of design is, of course, all important, and an opportunity for the expression of suppressed or unsuspected originality should prove very beneficial.

You may think what you like about the modern movement in the arts, but the world will never be the same place again. We may disapprove of modernity in art, but we can never go back to Academicism with the smug complacency of yore. The hollowness, the unthinkable dullness of it all, is now only too clearly apparent. And it is my hope that photography may fall in line with all the other arts, and with her infinite possibilities do things stranger and more fascinating than the most fantastic dreams.—*Photograms*, 1916.

COLOR PRINTS ON OPAL

By M. LE MÉE

IN preparing color prints on an opal support it is convenient to employ the bromide opals marketed by several makers of photographic materials and treated exactly like bromide paper. On this opal one image is prepared in the first place, viz., the yellow, from the blue-violet negative. The two other impressions are prepared on a glass plate coated with gelatin, and the two bound together film to film, so that the

final picture is obtained protected by a cover-glass. A great choice of methods is open in preparing the red and blue images, for a variety of chemical toning methods can be applied to a developed plate, but for the red image it will be necessary to use a dye bichromate method.

The yellow image is made on the opal plate itself. I use the Guilleminot lactate plates. The exposure is made



A GROUP OF PRINTS
BY KARL STRUSS
NEW YORK

in a printing frame behind the negative made through the violet screen. At about twenty inches distant from a candle the exposure necessary is about thirty seconds. Develop with ferrous oxalate or with the metol formula of the makers. Fix and wash as usual; the positive transparency is put to dry and the toning process carried on afterward.

To tone the transparency yellow the silver image is converted into chromate of lead. The plate is first placed in a mixture of equal parts of the following A and B solutions:

A	
Potass ferricyanide	10 gm.
Water	100 c.c.
B	
Lead acetate	5 gm.
Acetic acid	1 c.c.
Water	100 c.c.

The mixture of A and B is made at the time of use.

If the ferricyanide contains a little ferrocyanide—the commercial product almost always does—the mixture is turbid, owing to the formation of ferrocyanide of lead. It should be filtered before use. It is well to rinse the ferricyanide crystals quickly before dissolving them, to remove the greenish deposit on them. The solution of ferricyanide will keep for a fairly long time in the dark.

The plate is left in this bath until the image is completely bleached, which takes about a quarter of an hour. It is then put to wash for about half an hour, in order to remove all yellow stain. For obtaining perfectly pure whites the solution recommended by Namias may be used with advantage, viz., 1 to 2 per cent. nitric acid, in which the bleached plate is left for about ten minutes.

At this stage the image consists of a mixture of ferrocyanides of silver and lead. The lead is now converted into chrome yellow in a bath of bichromate, the silver being afterward removed by a solution of hypo. Namias suggested that the latter operation be done first; but it is a mistake to do so, since some lead ferrocyanide is also removed, and the resulting image is too weak. It might be feared that by using the bichro-

mate first chromate of silver is also formed, but this is not so; a bichromate solution does not act on the silver ferrocyanide.

In carrying out the process the bleached and washed plate is placed in 5 per cent. bichromate solution, in which it changes almost at once to a yellow—of shade modified by the silver ferrocyanide. The plate is then washed until the gelatin has been freed from yellowish stain, and is then placed in 10 per cent. hypo solution, which brightens up the image. It is left in the hypo for about ten minutes, in order to ensure removal of the whole of the ferrocyanide. After washing for half an hour (in five or six changes of water) it is put to dry.

For the preparation of the red image any dry plate—a fogged plate will do—is fixed in 20 per cent. hypo and well washed. A number of plates can be treated in this way and dried. The plate, wet or dry, is placed for four minutes in 2 per cent. bichromate solution, drained and dried in the dark. When thus sensitized it is used as soon as possible. It is used to form the red image. I have found that if the blue is formed first on it this first image diffuses into the second film of gelatin during drying, and thereby becomes badly defined. By beginning with the red this defect is avoided.

In the method which we describe the red images, as also the blue, are printed from positives, as in the pinatype process, and therefore it is necessary first to prepare positives from the negatives made through the green and red light filters.

The bichromated gelatin plate is then placed in a printing frame behind the "red" positive, film to film, and exposed to daylight. An actinometer may be used in judging exposure, or a similar positive may be placed alongside with a piece of P. O. P. behind it, the action of the light on the latter indicating the exposure of the bichromated plate. There is very little difference in the printing times of the two materials.

After printing, the plate is washed in several changes of water to remove the bichromate—that is, until the washings

are no longer yellow. The parts which have received the most light action—that is, the high-lights of the subject—retain a yellow stain, which must be discharged by means of commercial bisulphite lye mixed with twice its bulk of water. The plate is then again rinsed in two or three changes.

It can now be left to dry or placed at once in the red dye bath. To prepare this latter 5 grams of cochineal carmine (or the same weight of a pinatype Red F) is powdered and triturated with a little water to form a sort of paste, to which 10 c.c. of ammonia are added. After a few minutes make up with water to 100 c.c.

In this solution the gelatin absorbs dye only in the parts which have been more or less protected from light. The plate should be removed from time to time from the dye bath, rinsed quickly under the tap, and examined over a sheet of white paper. If it be examined by holding it up to a window it will probably be obtained of too great depth of color. When it is judged that the image is correct the plate is washed until the washings no longer show a red tinge. It is then placed for five minutes in a bath, which both hardens the film and fixes the color. This bath is:

Potash alum	2 gm.
Copper sulphate	1 gm.
Water	100 c.c.

The blue image has now to be produced on this same glass, for which purpose the first thing is to flow over a second film of gelatin; 10 per cent. solution of gelatin is made. I use Nelson's No. 2. It is put to swell in cold water, then heated on a salt bath to about 70° C., until completely dissolved, and then filtered hot through cotton wool.

For a 9 x 12 cm. plate 7 c.c. of gelatin solution are used. Use about 7 c.c. per square decimeter. The plate should be level when being coated. For this I use the following plan, recommended to me by M. Baudot, of Brest. The plate is simply flated on a bath of mercury (quicksilver). As the gelatin sets quickly in these circumstances it is well to make the back of the plate quite hot just before floating it on the

mercury. The gelatin solution should be 50° to 60° temperature. It is poured on the center of the plate and then spread evenly with a bit of bent glass tube, previously made hot. When the gelatin has set the plate is stood upright to dry, away from dust.

The next treatment is the same as for the underlying film. The plate is sensitized in the bichromate solution; or these two operations may be combined, *i. e.*, the plate flowed over with a solution of gelatin and bichromate. But it is best I find to make the operations separate, since the gelatin film, after coating, takes a long time to dry, while it dries rapidly after the bichromate bath. Now the bichromated gelatin soon loses its properties; by adopting the plan which I advise the work may be interrupted for any length of time after drying the gelatin-coated plates, and the latter rendered sensitive for use when one has the leisure.

When the second film of bichromatized (sensitized) gelatin has dried the plate is laid in contact with the "blue" positive in exact register with the red image on the plate. This register is done most simply as follows: Slide the two plates over each other, looking through them by artificial light or diffused daylight. In the case of plates of large size it is well first to put the positive in the printing frame, to place the latter across a couple of piles of books, arranging between them an electric lamp. The bichromated plate is then laid on the positive, and when it is seen to be in register it is kept in place with one hand while the back of the printing frame is put in (over the part not held by the hand) and sprung down.

Exposure to light and subsequent manipulations are the same as for the red image. The dye bath is made by dissolving 5 grams diamine blue or pinatype blue F in 100 c.c. water. The plate is dried without using an alum bath.

The only material difficulty in the process is that common to all three-color printing processes, *viz.*, the exact adjustment of the depth of the three primary printing colors, red, blue, and yellow. It is therefore important to know how to reduce or intensify one of the colors.



BY JANE REECE, DAYTON, OHIO

The red can be intensified by dipping the plate again in the dye bath. It can be reduced by applying to it under water a gelatin-coated paper (ordinary bromide paper, as purchased, will do). They are removed together from the water, a rubber squeegee passed over to make good contact, laying a piece of sheet of taffeta, a damp piece of felt or sheet of moistened blotting-paper, then a sheet of glass, and finally a weight such as a pile of books or box of negatives. The image transfers itself little by little to the gelatinized paper and so reduces the depth of the print. The process may be repeated several times.

It is evident that when we have tanned the gelatin, which contains the red image, and laid the blue image upon it, it is not possible to correct the red impression except by hand retouching.

The blue image may be reduced or increased in depth in the manner just described.

As regard the yellow image, its depth may be reduced by passing it through a weak solution of potash, which is a solvent of the lead chromate. If the yellow image is not deep enough there is nothing for it than to make another print on a fresh opal plate.

It is easy to judge of the respective depths by temporarily mounting the glass plate on the opal.

For the final mounting the glass and opal plates are placed film to film and adjusted into exact register, which latter may be examined with a magnifier. The plates are then held in place with metal clips, and, thus secured, are bound together with gummed paper.

The whole process may be applied to the reproduction of autochromes and similar transparencies, but it must not be expected that the reproduction will be equal to the original.—*British Journal of Photography*.



PRACTICAL PAPERS ON STUDIO WORK AND METHODS

Business Getting

THERE is no doubt but that a goodly number of talks could be given on the subject of business getting from the viewpoint of a photographer, and that each might cover the subject in a manner distinct and peculiar to itself. Many men are of many minds and there is no royal road to fortune and success, else everyone would be wending his way upon it, to the confusion and detriment of all travellers.

The personal equation enters largely into the explanation of the success of men in the various fields of endeavor. Some photographers who know not, are no doubt doing a lively business with a clientele that knows not, and are counted as successful, and yet their methods of doing business could in nowise be set down as a bright and shining rule, to be followed by other men of entirely different quality of brains and ability. The man who will thrive in one community may starve in another, and so it is, there must be different methods for different men, for different localities, and for different publics.

The small town man may have to cater alike to rich and poor, the cultivated and the ignorant, the artistic and the great army of those endowed with exceeding poor taste. A man so situated must be possessed with an acrobatic mind to be able to cover even the small field before him. In large communities there are large enough classes of citizens in each category to allow photographic workers to specialize.

The doctor in a small town must be a general practitioner; in the large communities he can devote himself successfully to one particular branch of his profession. Within the memory of living men a millionaire was a scarcity and his name was mentioned with awe and reverence; today millionaires, multi-millionaires, and families with yearly incomes of millions are found sprinkled generously in every city block. We have passed the period of corduroy roads and have entered upon an era of great fortunes, general education, and much culture.

Every town holds enough people who

appreciate the best that the world can give them, and who are able and willing to pay for the gratification of their good taste; therefore, I believe the photographic workers will each reach their own particular level, which level is fixed entirely by the quality of their individual brains and abilities. The young man, the middle-aged man, and perhaps even the elderly worker in the photographic field, should endeavor to develop the best that is within him, and in these days, for the best, he will receive ample reward.

At the same time, while striving for the big things, the little ones must not be overlooked, for in their sum they contribute in great measure to the success of a business, especially that of a photographer.

The first of these details, the majority of which are perfectly apparent to most of us, is a cleanly and attractive studio. Perhaps we are not possessed of that good taste which instinctively creates attractive and artistic surroundings; but cleanliness all can comprehend, and it lies as close to art as it does to godliness.

Cleanliness must not stop at the studio itself—and perhaps this admonition is not at all necessary—but must apply to the person and the clothing of the photographer himself and to his entire working force. The cheap trade will not, perhaps, mind a soiled collar, untidy finger-nails, or grimy hands; but the better class of clients, especially if they be of the gentler sex, while they may, as become ladies, tolerate the association with such an operator once they are committed to a sitting, it is safe to say will not repeat the experiment. It is true, clothes do not make the man; but, combined with personal cleanliness, they go a long way in proclaiming the gentleman and inspiring confidence and respect.

Good work attracts custom, good handling keeps it. Good handling is a matter of mind, as well as of raiment. Some sitters must be made to talk, others must be talked to. The operator, to be able to draw out his sitter, must reach into his own mind for the material. Thus, meeting many people of varying types and interest, he should be well equipped mentally

with material which should at least cover the main topics of thought of the times and especially of the day. No successful man can afford to vegetate, or bury himself in one channel of thought, unless he is writing, working, searching, or building for future generations. The photographer may do some few things which may live long after he has departed; but he himself must perforce live and thrive today, and consequently must so order himself and his methods as to secure immediate and satisfactory results.—*Association Annual*.

Keeping Your Business Vigorous

DISMISS the idea forever from your mind that because business is running smoothly and satisfactorily it surely will continue to do so from its own momentum, aided with a little effort now and then. Forget it!

There was once force that built up the business. The same force must be applied to it every day of its existence, and that force is:

Intelligent effort: Conditions constantly change: Keep in touch with new conditions. New forces enter the field: Watch them. These forces are different from the old ones and unexpected moves may be made to your detriment.

Open, watchful eyes and a clear, cool, and active brain must be the possession of him who would succeed today. Whatever technical knowledge in relation to his business he is supplied with, so much the better. And there is no single knowledge more important to a business today than advertising. Advertising is the great salesman. He voices his arguments through printers' ink and he should always be of the living present, sound in argument, happy in expression and dressed so as to win and please the eye.

Some may say that illustrations and types are matters that need not bother the merchant much, for they are fixed commodities and can he had anywhere at any time.

There is a taint of unsoundness in this logic, but let it pass. One ever present, ever live feature of advertising beyond the power of dismissal by any advertiser is: What to say?

Every advertisement must be thought out and written.

The business man who advertises must regularly answer the pertinent question of: What to say?

The goods and prices that are clamoring for advertising recognition force the issue: What to say?

The dull business of the present preys upon the merchant's mind and stirs up the eternal advertising question: What to say?

The sale about to begin asks with a great interrogation point the conundrum: What to say?

The sale already under way and which must be fed with the food of good advertising propounds the problem: What to say?

The new goods—dainty, delicate, desirable, stylish, serviceable, sensible—the harbingers of the coming season's fashions, fads, and fancies, whisper with gentle but irresistible insistence the ticklish question: What to say?

The old goods that are eyesores, because not in the public's possession long before, ask in a gruff, husky voice, as though they themselves were tired of lingering on the merchant's shelves: What to say?

The march of business improvement keeps quick time to the tune to which these words are answered: What to say?

The standstill of business under inert or incompetent direction seems to hush itself because there is no answer to: What to say?

The retrograde movement of trade gives the abject shuffle of the bankrupt, because of the inapt and unbusiness-like answers to: What to say?

What to say? is the great question that confronts every business man who advertises. If he answers it right it is probably because he has properly replied to the other great question: What to do? or, in other words, he did what he should in his storekeeping, the right expression of which appears in his advertising.

Wonderful

It is perfectly wonderful, far beyond the comprehension of some of us, when we see the work which is turned out by photographers with the apparatus which they have to work with. How many of them succeed in doing as good work as they do we cannot understand, neither do they realize how much this work would be improved if they had the proper apparatus.

We believe there are some studios that never heard of a silent shutter, for their shutter works like a trip-hammer and you can hear it all over the studio. The time lost in wrapping the plate-holder in the focussing cloth to prevent fogging the plate during the month of December, would pay for many new plate-holders. The time lost shifting the sitter from one place to another, or shifting the background from one place to another, in order that the holes punched in the same will not show in the picture, would buy many a new background. The time lost in the reception room trying to explain to customers why pictures are not what they expected, when they are simply underexposed on account of the slowness of the lens, would buy a new lens in a short time.

Efficient apparatus in all branches of the studio more than pays for itself in time saved during a few weeks of rush work.

We are not surprised that many customers are disappointed when they receive their proofs, when we take into consideration and see what the photographer has to work with. The customer does not know that the pictures which they have seen made in another studio are better because of the apparatus used. They only know that they are disappointed in the results. The photographer should know why this difference.

If it is impossible to purchase new outfits, it is possible to put the old ones in the best of working order, and oftentimes the cost is very small. The nervous strain on an operator when he is trying to make some exceptionally good work of some exceptionally fine customer with apparatus that is uncertain costs him more than a new camera. But how can we make the operator believe it? There is no reason why we should not throw away

an old camera or an old lens just as we would throw away an old hat or an old pair of shoes. Many will throw away an old hat or old shoes because they are out of style and they are afraid their friends will notice the same. The hat may be in perfect wearing order, but they will leave their old outfit in their studio for their customers to see and never think that this affects their business in the least.

The appearance of the studio should be in keeping with the appearance of the photographer when he is dressed up in his Sunday suit.—*Ohio Photo News*.

Pointers on Composition

A PORTRAIT is the record of a person at a certain age, in a certain mood, in a certain garb. A good print is the result of what has happened in the studio previous to pressing the bulb.

One of the most, if not the most important factor in arranging the composition of a portrait is the correct placing of the head.

It is a fundamental rule that the face should never be placed in the centre of the picture.

A portrait (in particular, a bust portrait) should be as simple as possible. It should explain itself at first glance.

Never use the profile view unless the face warrants it.

The unsatisfactory rendering of hands is one of the drawbacks of photographic portraiture.

A background always consists of two masses, one lighter than the other.

The trouble with the painted-in backgrounds that have lately become so fashionable in photography is that they are not made by trained artists.

In groups, the people must do something, or be interested in something, or the result will, in nine out of ten cases, prove unsatisfactory.

In photographic portraiture the simple light effects are the best.

The face should present the largest lighted plane in a portrait.

The larger the range of light and shade, the more accurate in expression, in construction, and modelling the face will become.

The strongest high-lights on accessories always sacrifice something of the likeness to a pictorial effect.

Portrait photography has become more pictorial, but less clear and precise in expression.

The keynote of color in the human face is light, and it should be rendered in that way.

The majority of portraits today look as if the people depicted were mulattos or quadroons, which is not particularly flattering to the sitter.

The shadows of a hat can be used to great advantage as an eliminator of details in the hair.

The mother-and-child picture is apt to produce an emotional effect, and the better it does this the more satisfactory is the portrait as a picture.

The most natural and generally accepted method of placing the heads in a mother-and-child picture is to place the head of the mother higher than that of the child.

In draping, everything depends on lines that flow freely, that do not obscure the form, yet do not show it too clearly.

The less use you make of furniture the better you and your pictures will fare.

In photography, the representation of one picture in another should always be avoided.—SIDNEY ALLAN.

The Price and the Reason

THE advancement in photography in the last twenty-five years is far in excess of that which is realized by the casual observer, and yet the professional photographer stands away below par so far as commanding the dignity and respect of the public is concerned as compared to days gone by. Today there are too many who profess and are unable to "make good." Too many wise ones minus ability. The amateur, as a rule, is wise, but doesn't know. There are amateurs who are posted, amateurs who are indeed the expert, but they are not the rule. The first thing that the amateur of today sets forth is the postcard fad at "cut-rate" prices. As soon as the camerist is able to discern the image on the ground-glass, he enlists in the "army of photographers," and is generally a good customer for "ammunition" from the beginning. He is not going to make photographs for the fun of it any longer. He is going to sell his productions at some price—whatever that is. Of course, he will get all he can, that is natural, but it is the beginning of a new schedule to be added to the innumerable ones already in vogue.

We now come to the postcard man—the 50 cents per dozen man. Then the better studios who make postcards at all the way from 75 cents per dozen to \$2.00 per dozen. Is it proper that studios—good studios—should make postcards at all? How many of you have had customers to enter your studios, prospective customers for good work, at at least a fair price, and before leaving the studio leave their order for a dozen or two of postcards? How many of you have heard this remark in your own studios: "We'll just have postcards now, and get something better later on?" Alas! too many have heard the same old story. Then, what is the remedy? Stop making the postcard. Just so long as the feeling exists that "we make them because the other fellow does," just so long will the ruinous effects of the postcard be prominent.

This is not a decry of the postcard—not by any means; the postcard fad is on, the postcard man has his place; if he hasn't, he should have; the postcard business has proved lucrative to many a firm, is a prosperous business in its place, but keep it out of the well-regulated studios. It has done more to demoralize the price of good, substantial, honest photographs than any other one thing to my knowledge.

A great deal can be said of the coupon and ticket schemes, many things far from flattery, but the ruinous effects of these are practically worn out as compared to the postcard portrait of today.

You will ask, How quit making postcards when Jones makes them at 75 cents per dozen; Smith makes sepias at \$1.25, while Brown makes vignettes at \$1.50, with a beautiful folder thrown in?

There is but one remedy: organize. Either stop making them or place the price where the

matter will take care of itself. Of course, it is easier to organize than to remain organized. 'Tis true, nevertheless, that is the one remedy, and unless taken advantage of you must be content with the curse of the postcard.

Organize locally, compromise, have an understanding between yourselves, stick to the agreement, and take your medicine either one way or the other.

Minimum Prices

WE realize it will be no easy matter to get the photographers to see that they have everything to gain and nothing to lose by adopting a reasonable schedule of minimum prices for different grades and sizes of work.

There is no reason why the regular photographer should make post-cards for less than a certain price per dozen, no matter where he is located, and there is no reason why the regular post-card photographer should not get a certain price, wherever located.

The minimum price on 4 x 6 prints, in dozens, mounted in folders, could be easily established, and those who wish to get more, by giving a better folder or anything of that kind, could easily do it.

If a few photographers would put a little time and energy into this proposition, or the National Association would take it up, it would aid much in increasing the profits of the average photographer.

The only way it will ever be accomplished is by a few taking hold and gradually getting others to follow.

It is born in some people to sell cheaply. They are under the impression that it is the way to get business and make profits. This is entirely wrong. The photographers in the past have cut prices to the limit. Show me the photographer in any city or any town who has cut prices and made profits. It is true there are some who will put out a ticket scheme at a low price, and then raise customers when they come in, but they seldom get the same customers a second or third time.

Let us hope that photographers will never again seize any opportunity to reduce prices. They should first make, and then maintain, prices which will give them a good profit.

Photography is a business which requires brains, men that are amply qualified to make good wages at any other trade should they attempt it. Many photographers are qualified to design materials and apparatus which would be of benefit to the profession. But there is no encouragement for this kind of work when photographs are sold at bargain prices.—*Ohio Photo News*.

Re-orders

ORDERS for duplicate copies from old negatives do not seem to form such an important part of a portrait business as they used to do, and it is desirable to trace the reason for this falling-off. In some cases it is due to a rather shabby though perfectly legal action on the part of the customer, who has a few copies from a good photographer, and gets further prints made by a cheap copyist. For this state of things there is no remedy. In

many cases it is, however, the fault of the photographer himself for not clearly pointing out, when completing the original order, that additional copies can be had at a reduced price in the same or any other process. During our peregrinations last week we happened to be in a certain reception room when a customer came in and, producing a faded cabinet on albumen paper, asked if the negative were still in existence, as if so he wished for some copies from it. The receptionist assured him that the negative was preserved, and, being well up to her work, asked him by what process he would have the prints made. This seemed somewhat of a surprise for him, for he expected only to be able to have silver prints upon gold bevel mounts. He finally decided upon carbons on large Japanese vellum mounts, giving an order greatly in excess of the amount of the original sitting. It is well worth while to enclose with each completed order a printed slip giving the price for duplicates in the same and other styles, and also prices for enlargements, at the same time emphasizing the great superiority of the prints when they are produced from the original plate, but, on the other hand, pointing out that old photographs can be copied in various styles, to match the prints now sent.

The question of price is a difficult one to settle. Some portraitists quote duplicate prices upon their ordinary list, but this does not tend to clearness, and it also has the disadvantage that it does not cover new styles. On the whole, we are inclined to think that it is better to allow a fixed percentage off the prices for original orders, 25 or 33½ per cent. being a fair allowance. A little care is necessary in arranging a list so that it is not possible for a customer to get, say, a dozen prints more cheaply by ordering a half-dozen at first and another half-dozen later, a thing we have known to occur. We have a price-list before us in which half-dozen are charged at two-thirds the price of dozens, and three copies for two-thirds the price of a half-dozen, while duplicates are in all cases two-thirds the prices for similar quantities and styles. This idea may not appeal to all photographers, but it certainly appears to be better to have some businesslike system of charging than to indulge in the mass of inconsistencies which one so often finds, and which the receptionist never succeeds in mastering. With reference to recent sittings with which customers are well pleased, it will often be found profitable to submit a proof upon any new mount, or by any new printing process which may have been adopted since the sitting; this will often suggest a re-order, and also help to get the new style known, for such a proof is sure to be freely shown to relatives and friends. It is, of course, a little speculative to do this sort of thing, but it is not open to the objections which exist against the invitation system. It might also be made the means of introducing the "standard" sized mount into a district, if a note explanatory of the system were sent with it, making it the excuse for submitting the print. The device may fail in its original purpose, but it is certain to serve as an advertisement, and if it brings fresh sitters instead of re-orders, so much the better.—*British Journal of Photography*.



The British Journal Almanac for 1917

ALTHOUGH this year's almanac is somewhat reduced in size, reflecting conditions of the times, it is up to the standard in the quality of the information and still remains a veritable "photographers' daily companion" quite indispensable. Such subjects as: "Apparatus and Equipment," "Negative Processes," "Printing Processes," "Color Photography," "Formulæ for Principal Processes," etc., are classified and treated in a thoroughly suggestive and practical manner for references. We are told that "the paper question" is chiefly responsible for the reduction of this year's edition by one-third, so that orders not to disappoint should be sent promptly. Price, paper, 50 cents; cloth, \$1.00. G. Murphy, Inc., Agent, New York, or through this office.

Awards John Wanamaker Twelfth Annual Exhibition of Photography March 1st to 17th

FROM more than 1100 pictures submitted by 250 workers the judges selected 55 as being worthy of special notice.

While these were the only pictures hung in this Twelfth Annual Exhibition, the average quality of all pictures submitted this year was superior to that of any former exhibition.

Prizes Awarded

First, \$100. "Wall Street." Paul Strand, New York City.

Second, \$50. "In a Boat Yard." Leonard Westphalen, Chicago.

Third, \$25. "A Vale in Arcady." John Paul Edwards, Sacramento, Cal.

Fourth, \$10. *With Special Mention*. "Flames of Oil." B. F. Armiger, Philadelphia.

Fifth, \$10. "East Side." Karl Struss, New York City.

Sixth, \$10. "The Sermon." Frank V. O'Connor, Chicago.

Seventh, \$10. "Thou Shalt Not Covet." W. G. Fitz, Philadelphia.

Eighth, \$10. "A Dune Composition." Ernest P. Thurn, Chicago.

Ten \$5 prizes: "A Mountain Home," M. V. Browning, Littleton, Col.; "Winter's Snow," L. F. Deming, Philadelphia; "Weird Grove of Death," John Paul Edwards, Sacramento, Cal.;

"South Penn Square, Winter," W. G. Fitz, Philadelphia; "River Scene," H. Crowell Pepper, Cleveland, Ohio; "Brooklyn Bridge," Karl Struss, New York City; "Eugene Hutchinson," Edward Henry Weston, Tropic, Cal.; "Miss Dextra Baldwin," Edward Henry Weston, Tropic, Cal.; "In a City Park," Leonard Westphalen, Chicago; "The City That Stands on a Hill," John Wray, Brooklyn, N. Y.

Assistant Photographer for U. S. Reclamation Service

THE United States Civil Service Commission announces an open competitive examination for assistant photographer, Reclamation Service, for men only, on April 18, 1917. A vacancy in Washington, D. C., at \$1020 a year, and future vacancies requiring similar qualifications will be filled from this examination, unless it is found in the interest of the service to fill any vacancy by reinstatement, transfer, or promotion.

The duties of this position will be mainly those enumerated in the paragraph below as prerequisites for this position.

Competitors will be examined in the following subjects, which will have the relative weights indicated:

<i>Subjects.</i>	<i>Weights.</i>
1. General principles (including view photography, chemical manipulations, printing, toning, developing, and redeveloping) . . .	40
2. Bromide enlargements, lantern slides, transparencies . . .	30
3. Training and experience . . .	30
Total	100

Applicants must have actual commercial experience in view photography, bromide enlarging, making good scenic lantern slides, copying on dry plates including color copying with screens, preparation of developers, chemical baths and mixtures used in dark-room work, making transparencies on plates and celluloid films, printing gaslight papers, toning, redeveloping, and some flash-light and portrait work. A fairly detailed statement as to the amount of above experience should be included in the application.

Statements as to training and experience are accepted subject to verification.

Applicants must have reached their twentieth birthday on the date of the examination.

Applicants may be examined at any place at which this examination is held, regardless of their place or residence; but those desiring appointment to the apportioned service in Washington, D. C., must be examined in the State or Territory in which they reside and have been actually domiciled in such State or Territory for at least one year previous to the examination, and must have the county officer's certificate in the application form executed.

No sample questions of this examination will be furnished.

Applicants must submit to the examiner on the day of the examination their photographs, taken within two years, securely pasted in the space provided on the admission cards sent them after their applications are filed. Tintypes or proofs will not be accepted.

This examination is open to all male citizens of the United States who meet the requirements.

Applicants should at once apply for Form 1312, stating the title of the examination desired, to the Civil Service Commission, Washington, D. C., or to the secretary of the United States Civil Service Board at any place mentioned in the list printed hereon. Applications should be properly executed, excluding the medical certificate, and filed with the Commission at Washington in time to arrange for the examination at the place selected by the applicant. The exact title of the examination as given at the head of this announcement should be stated in the application form.

Issued March 9, 1917.

David Stern Co.'s New Catalogue

THIS new catalogue shows a complete line of cameras, lenses, motion-picture cameras and photo accessories at unusual and attractive prices. Send for a copy of Catalog No. 511 if you are looking for reliable bargains.

Los Angeles Photographic Salon

THE Southern California Camera Club announces a photographic salon to be held during the latter part of May in the rooms of the club in the Lyceum Theater Building, Los Angeles. Contributions of pictures are solicited from photographers everywhere. While no prizes will be awarded, a standard will be maintained in the hanging of pictures that will render the hanging of a picture in the Los Angeles salon a recognition of high artistic merit. The selection of pictures to be hung will be by a disinterested committee of three recognized artists. While it is requested that mounts do not exceed thirty inches, largest dimension, prints will be disbarred only because in the opinion of the judges the pictures do not represent the highest standard of the pictorial qualities. Prints must be in the hands of the print committee of the club not later than May 1.

Entrance blanks are obtainable upon application to Miss O. P. Close, 313 West Third Street, Los Angeles.

The New Technicolor Process

THE new color-process developed for the technicolor Motion-Picture Corporation by a firm of research engineers, Kalmus, Comstock & Wescott, Inc., bids fair to become an important commercial development. The pictures, are capable of showing rapid motion without the well-known color-fringe phenomenon; and since they do not depend on physiological synthesis for their color effects, there is no unnatural eye fatigue.

Several thousand feet of film have been privately exhibited in Boston, and have met unqualified approval from a large number of critical observers. The company is now taking pictures in the vicinity of Jacksonville, Fla., to be used in the production of a five-reel feature which will be ready for the public before many weeks.

A particularly important innovation which these engineers have instituted is a portable film laboratory and development plant built into a Pullman car. This results in a material advantage through the fact that hitherto a great deal of inconvenience has been suffered on account of the necessity to send the films for development to a distance from the place at which they are taken. Faults in the film have therefore been discovered too late for easy correction. With the new portable plant on the scene of production, the final film can be examined on the screen almost immediately after it is taken, so that it is quite convenient to retake any portions that may require it.

The plant is also particularly impressive on account of the completeness of its automatic control. Practically nothing from start to finish is left to the guesswork of the operators. Machines invented for the purpose apply all wet treatment to the film; the camera is motor operated at exactly the desired speed, and the exposure allowed the negative is determined by a scientific light-measuring instrument of new design.

As regards personnel, C. A. Willatt, well known as "Doc" Willatt in the motion-picture world, of which he is one of the leading experts, is director of the department of production. The technical staff includes Dr. Herbert T. Kalmus, former director of one of the Canadian government research laboratories; Dr. Daniel F. Comstock, of the Massachusetts Institute of Technology, and Prof. E. J. Wall, the well-known photographic expert. The equipment is in charge of W. B. Wescott.

We understand that the Technicolor Company is amply financed, and that rapid commercial development may be expected.—*The Photo-Era*.

New Goods

THE Wollensak Optical Company, of Rochester, New York, makers of the Verito diffused focus lens, make special announcement of the introduction of a set of diffusing stops for use with the Verito lens in enlarging.

Heretofore, in order to obtain enlargements that possess the quality of diffusion that was most pleasing, it was necessary to make a series of ex-

posures at different apertures, making it rather impractical for the average photographer, as it was not an easy matter to gauge the required exposure at the different apertures to make up the complete amount of exposure necessary for the enlargement.

The new Wollensak diffusing stops for the Verito eliminate the necessity of making different exposures, and by the employment of one of these stops an enlargement with a rare quality of diffusion is obtainable. There is no other method that will produce this quality of diffusion now being employed.

There are three stops to the set, governing three different degrees of diffusion, so that the operator can use whichever one suits his fancy best. The price is \$7.50, which includes the adapting of these stops to the barrel of a new Verito or of a Verito already in use.

The manufacturers will be glad to send special literature concerning same to all interested.

Alvin Langdon Coburn's "Vortographs" at The Camera Club, London

MR. GEORGE BERNARD SHAW was a visitor to the Camera Club recently, says the *British Journal*, and took part in a discussion on Mr. Alvin Langdon Coburn's "Vortographs," which are at present on exhibition. Mr. Coburn, who preferred to leave a veil of mystery over his mechanism, said that the making of these pictures was the most thrilling experience he had ever had in all the realms of photography. For over a quarter of a century he had been using a camera in one way or another, but never had he discovered a medium to compare with vortography for producing esthetic excitement and enjoyment. It was like reading one of the stories of H. G. Wells. Vortography made it possible to become abstract with the camera. No longer was it necessary to tramp for weary miles through muddy lanes carrying a 10 x 8 outfit. You simply sat by the fire in the studio, manipulated your vortoscope, and wandered at will in a strange, unknown land of forms and patterns. Why should photographers go on making prints which could be catalogued as portraits, landscapes, and figure studies, when all the vast country of the unknown stretched out before them? The combination of masses was limitless; even the same series of masses, with different illuminations, offered a great variety to the student of vortography. He claimed for his new medium that it would do in photography, in the hands of the sympathetic worker, what Cezanne, Matisse, and others had done in painting, or Scriabine, Stravinsky, and others in music, as against academic traditions. It would show us big, primitive things almost for the first time. While declining for the present to reveal his vortoscope, he declared that he was deeply serious about vortography and its possibilities.

After Mr. Ezra Pound had given a psychological or even physiological defence of vorticism and cubism, and some sorts of futurism, urging that the pleasure given by such produc-

tions was simply the pleasure of pattern, and was referable to the fact that the retina liked not only to be stroked or pushed by light-waves of various colors but also to be struck by those waves in certain arranged tracts, Mr. George Bernard Shaw got up and proceeded, as a subsequent speaker said, to praise the vortographs with faint damns. Mr. Shaw confessed that he liked Mr. Coburn's work, but he appeared to be a little uncertain as to how far his appreciative faculty had been seduced by the fact that the eighteen vortographs exhibited were all of them excellent examples of photographic printing. Mr. Coburn was a good printer, and for his own part he would prefer to know how he did his printing than to hear by what system of prisms he arranged his subjects. But still, if Mr. Coburn had sent his negatives out to be printed, and the result had been a series of perfectly commonplace bromides, Mr. Shaw thought that the arrangement of lines and masses in some of them would continue to give him pleasure. It was not Mr. Coburn's business to explain the meaning of his forms and patterns. Of one thing they might be sure: if a piece of work afforded anyone esthetic pleasure, sooner or later some sense would be found in it. The pleasure in a thing was always discoverable long before the sense. The sense of these "vortographs" has not yet been worked out. He was content to find a certain amount of pleasure in them, too admit the fact, and, for the rest, to take refuge in silence.

Other members of the club, however, failed to observe the rule, and let themselves go pretty vigorously.

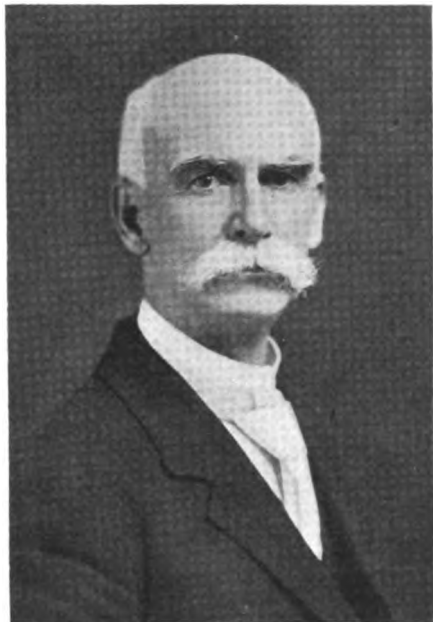
Pirie MacDonald Says

"YES, I have used the Cooper Hewitt light from the time it first came out. I used it exclusively, as I prefer it to daylight in every way. I draw these shades during the sittings, so as to entirely eliminate daylight" (he pointed to the ordinary opaque green shades at the several windows in the room): "I found long ago that I could get all the effects with Cooper Hewitt light that I could get with a skylight, and get them invariably. You can see for yourself,"—and he swept with his glance the three sides of the room which were hung with examples of those wonderful life-like portraits that have made the name of Pirie MacDonald known wherever photographic art is appreciated. Following his suggestive glance, I recognized the faces of men prominent in their various walks of life. In each case the portrait, like the subject, was a distinct, impressive personality. There was no attempt at flattery, at idealism. "But this does not preclude a wide scope of artist's treatment. Here, for example, the modelling is rugged and bold—a vigorous lighting; while in this, the soft gradation of half-tone is the keynote. Here is a lighting that was once almost a fad,"—indicating a striking Rembrandt effect.—From "*An Interview with Pirie MacDonald*," by William C. Hubbard.

Death of Dr. Thomas W. Smillie

THOMAS WILLIAM SMILLIE, fellow of the Royal Photographic Society, photographer for the National Museum, and custodian of its section of photography, died in this city early Wednesday morning, March 7, 1917, in his seventy-fourth year, after a short illness.

His associates in the Smithsonian Institution and its several branches assembled at a meeting in his memory in the National Museum on Thursday, March 8, to record their deep sorrow in the loss of a sincere friend and capable and willing collaborator, and one of America's foremost photographers.



THE LATE DR. THOMAS W. SMILLIE

Mr. Smillie was born in Edinburgh, Scotland, on April 14, 1843, coming to Washington with his parents about 1848. He was the son of a celebrated landscape gardener, and maintained, himself, throughout his life an intense love for flowers, trees, and nature in general.

He was educated at Georgetown University, specializing in chemistry and medicine, but giving up his studies at the end of two years on account of ill health. While he received no degree in either of these courses, the early training laid a good foundation for his career as a scientific photographer in later life.

- During 1869-70 Mr. Smillie was temporarily employed by the Smithsonian Institution, and in June, 1871, was appointed photographer for the National Museum, remaining at the head

of the photographic laboratory until his death. Early in his work here he undertook the preparation of a photographic exhibit, and in 1897 was made custodian of the collection illustrating the history of photography.

Mr. Smillie's researches extended over nearly every branch of photography, and he was the author of numerous articles, two them published by the Smithsonian. He revised and edited *The History of Discoveries in Photography*, by Robert Hunt, also published by the Institution.

In addition to his work in connection with the National Museum, Mr. Smillie served for several years as expert in the matter of inks for the Post-office Department, and did a large amount of valuable work for the Fish Commission during its early days. Particular reference should here be made to the enlarged photographs prepared by him for the various fisheries exhibits.

Mr. Smillie was of the greatest assistance to the late Secretary Langley when he first introduced photographic recording with the bolometer for mapping the infra-red solar spectrum, and later when investigating the flight of soaring birds. At the total solar eclipse of May, 1900, Mr. Smillie had charge of all photographic work of the Smithsonian expedition to Wadesboro, North Carolina, and to his skill is mainly due the attainment of successful results.

In the early days, before photography became a popular pastime, Mr. Smillie was one of the organizers and the head of the first amateur photographic society in Washington. He was the inventor of a process of photographing on wood for engraving, and became an honorary member of the Paris Academy of Inventions. He was also a member of the American Association for the Advancement of Science, the Philosophical Society of Washington, and the American Academy of Political and Social Science.

Mr. Smillie will be remembered by all of those with whom he had connection as a quiet, unassuming man, and willing and helpful to the last degree.

Sepia Toner

BURROUGHS WELLCOME & Co. are now issuing a special formula under the name of "Tabloid" Brown Toner for the purpose of toning sepia prints on bromide or gaslight papers to the colder, richer brown which is preferred for certain subjects. It is also suitable for use with sepia-toned lantern slides.

The process is very simple. Take a print or slide previously toned with the sepia toner and immerse it in a solution of one "Tabloid" Brown Toner in one ounce of 10 per cent. hypo solution. The warm sepia changes first to a cold brown and finally to a rich brown-black. Time of immersion, two to ten minutes, according to tone desired. After toning, wash in running water for thirty minutes. This formula will not tone black prints; it is for use with sepia-toned prints only.



WORTH-WHILE LETTERS ON LIVE IDEAS FROM OUR CONTRIBUTING EDITORS

A Giant Enlargement

AN advertising show was held in our city from January 31 to February 3, and we were called upon by the largest newspaper (the *Milwaukee Journal*) to make a giant newspaper to fill in the background of their booth. Knowing that this was the largest job of its kind ever done in the middle west, we thought the history of its making might be of interest to your readers.

A standard-size newspaper was submitted to us for copy, from which we made 8 x 10 negatives of the two pages. As they did not want a patched up job, it became necessary for us to make four enlargements, each 40 inches wide and 108 inches long. To start with, we had to have two trays made out of one-inch lumber that were 48 inches wide and 10 feet long. These were coated with Probus enamel to make them waterproof and cost eighteen dollars for the two. Two stretcher frames, 80 x 108 inches, were made of dry kiln lumber, and were reinforced all over with angle irons, and then finally covered with a good grade of linen. The lumber and materials to make the frames cost twenty-five dollars, and the linen to cover same cost eight dollars.

These stretchers were then taken into our enlarging room and used as backgrounds for focussing. After the exact focus was obtained and a correct exposure procured with numerous

test strips, we proceeded to put up our two big strips of paper, Eastman's Standard B. Bromide, D. W. each 40 x 108 inches, matching them in the center. We used a 12-inch Goerz Dagor lens with the new Cooper Hewitt "M" shaped tube. The final exposure was fifty-five minutes. Each strip was developed separately in the large trays. It took 700 ounces of developer to develop the four big strips for the two pages. The cost of the bromide paper alone was thirty dollars.

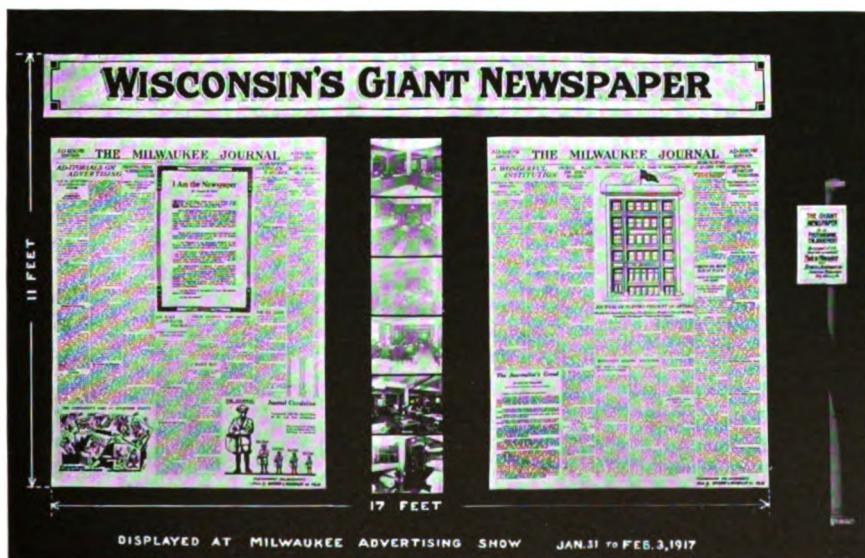
It took three of us twelve hours before we had all of the enlargements in the wash-water. They were then placed on a large strip of oil-cloth, face down, for mounting. The paste was applied with a paperhanger's brush, the prints were mounted on the large stretchers to dry, and were finally ready to be set for the exhibit.

Enclosed find two photographs of the finished product. As far as known they are the largest facsimile of the newspaper ever shown, and are considered one of the greatest photographic feats of the kind ever performed here.

If this is of interest to you or your readers you may use same at your discretion and with the understanding that we are to have credit for the work.

Sincerely,
BROWN & REHBAUM, Inc.

Milwaukee, February 24, 1917.



A Simple Method of Exposure Calculation

I BELIEVE that I have a system of exposure calculation original, simple, and more comprehensive than any in use. I have always depended, more or less, on the observation of the ground-glass to determine the exposure, but have found it rather erratic. Recently I made an additional screen of blue and find it a big help in determining the correct exposure. It gives an image in blue monochrome (which the eye easily transposes to black) by absorbing most of the other colors making the image. Very few persons can entirely disassociate the charm of color from the beauty of form and gradation, when seen on the focusing screen, causing many disappointments. The image in blue monochrome is undecieving and reveals the true photographic value. It also makes it easier to expose, by reducing the yellows and reds to more nearly their true luminosity as seen by the ordinary ortho or iso plate. With a panchromatic plate this would not hold true. Take a dry plate, fix it thoroughly, wash well, and dye in blue aniline dye. (The ordinary "Diamond" dye will do.) Take care not to make too dense or spot with undissolved dye. A blue that will absorb about three-fourths of a bright yellow or one-half of the red from a ruby light is satisfactory. Now dry. Fasten to back of ground-glass, emulsion side in, with a trace of glue on edges.

The system of exposure calculation that follows is original so far as I know. Take your camera and focus on subject with lens wide open. Next stop down until you have brightness wanted in the finished picture or until you can just easily see the darkest detail you want shown. Note the stop in diaphragm and it is your "brightness factor." Then refer to table. Find your "brightness factor" at top of table and in column under it will be found the exposure for the different stops as listed at left of table. Care and judgment are necessary in deciding on the factor. However, if it is correct the exposure will be correct under any conditions. The table would need to be modified to fit density of screen used, method of development, and style of negative wanted.

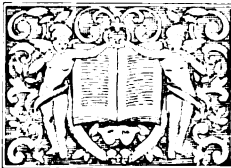
The advantages are:

- Reduction of image to monochrome.
- Ease of judging brilliancy of image.
- Automatic corrections for style of subject, quality of light, time of day and year.
- Corrected for scale of reproduction and for single combinations of convertible lenses.

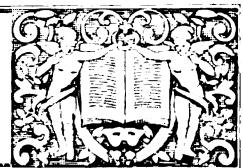
The disadvantage is:

- There would be some difficulty when focusing with a slow lens and very weak light.

It could be helped by a lighter blue screen and a table to fit.—J. M. AFFLECK.



AMONG THE SOCIETIES



Report of Professional Photographers Society of New York

THIRTEENTH ANNUAL CONVENTION, HOTEL MCALPIN, NEW YORK CITY, HELD FEBRUARY 26, 27, 28, 1917

First Day—Morning Session

The Convention was called to order by the President. Mr. Stromeyer was then presented. He, on behalf of the Metropolitan Section, tendered a hearty welcome to all our members. The President then gave his annual address. Reports were received from the following sections: Southern, Rochester, Geneva and Buffalo. The following committees were then appointed:

Committee on Resolutions: Messrs. Stromeyer, Beach, and Smith.

Committee to select place for holding convention in 1918: Messrs. Hoyt, Lifshy, and Park.

Nomination Committee: Messrs. MacDonald, Mock, and Hale.

Mr. Core then submitted a picture that he had made on very short notice. He explained the simple working of this process. A vote of thanks was tendered Mr. Core.

Mr. Beach, at the request of the chair, told of his visit to Milwaukee. He complained much of the chill of Milwaukee's winter (it must have been cold, as his home town is no winter resort.) In due time he did thaw out, as witness his praise of Milwaukee's chief product.

Mr. Core then started an experience meeting, calling on different members. Mr. McFarland, of Canandaigua, was first called. His contribution was a vertical stunt in enlarging.

Mr. Loomis, of Elmira, spoke about Tungsten lamps.

Mr. Stone, of Hamilton, New York, spoke on the value of coming in personal contact with your customers.

Mr. Byron was excused from speaking, so long as he would just smile: he bravely did his duty.

Miss Stewart, of Canandaigua, gave advice to the Convention, which was that all photographers attending conventions should see that their local papers were informed of their journey in search of new ideas.

Gustaf Loree, of Albany, spoke on the high cost of producing photographs and the proper pronunciation of names.

Mr. McGeorge's (Buffalo) talk was about his noble service as usher in the Tabernacle of Billie Sunday. He advised his hearers to follow the energetic method of his patron saint.

Mr. Smith, of Rochester, showed a very clever idea in vignetting for gaslight papers.

Mr. Boice, White Plains, closed the morning session.

Recess until 2 P.M.

Afternoon Session

Miss Gerhart, on salesmanship, gave a very interesting and instructive talk. It was received with a great deal of favor and much applause.

Mr. Core then followed with the second edition of his experience meeting. His first victim was Mr. Zackaries, from far off New Zealand. He spoke of his country and its lack of photographic societies, and his hope on his return home of being able to instil into the minds of his fellow-craftsmen the American idea of "help one another."

Mr. Crawford, of Hamilton, Canada, spoke of the great work being done by the Dominion during this crisis in the history of his country.

Mr. Cunningham, also of Hamilton, favored bi-focal at the top, and rightly said our attendance was much too small.

Miss Surdame, of Toronto, in a very concise talk showed that good work could be done in a department store if you have the proper system.

Mr. Buxbaum gave a demonstration of his Dore-type. He told of his method of toning and backing. Mr. J. C. Abel verified the statements of Mr. Buxbaum. An adjournment of ten minutes was then taken to properly view the very fine exhibit of Dore-types by Mr. Buxbaum.

Mr. Parke, secretary of the Mohawk Society, gave many short cuts and formulas that should prove to be of great value to his hearers; even a hot poker has a photographic value.

Mr. MacDonald then introduced Mr. Mason, of Roosevelt Hospital, as the oldest photographer still in active harness. Mr. Mason had on exhibition several prints showing his many inventions, all of them in daily use by him.

Mr. Notzel, of Newton Centre, was called on for a few words.

Mr. Leatherdale, of Toronto, Canada, spoke of the great value of cooperative advertising and the good result it has brought to the Toronto photographers.

Mr. O. Shaw, of Meridan, Conn., gave a few hard raps at the folly of selling tickets.

Mr. Spellman, of Detroit, spoke about the value of changing his display every other week. He has found it of great value.

Mr. Mock gave expert testimony of the value of fires. From his statement it would appear that Mr. Mock has been fully informed on the prevailing war prices of chemicals, metol in particular.

Adjourned at 4.45.

Second Day—Morning Session

This was the big day of the Convention, given up entirely to demonstration and talk. At no time in the history of the Society have they ever been equalled.

The first demonstration was made by Miss May L. Smith, of Binghamton. She showed how she obtains the charming results so well represented in her exhibit at this convention. She further illustrated her talk by photographs.

Then came Clarence White, in a plea for the sincerity of your daily work, in a talk both gay and serious, often brilliant. He traced his struggle for recognition in his chosen field of pictorial photography. From a clerk in a country grocery to a lecturer at Columbia University is a jump that was not done in a day. What a calamity to the photographic world had that sentence of death passed upon him by Todd, Benjamin, and Ingles, at Cincinnati, been carried out; he got away, hugging his gold medal. At the conclusion of his lecture he passed around the negatives from which his exhibit was made.

Recess until 2.30.

The luncheon at Murray's for the ladies was, I am told, a real love-feast. It was up to the standard of that famous house and forty ladies were present.

Afternoon Session

Dudley Hoyt came first. His demonstration of posing and lighting was up to the high mark set by him in all his work. No higher tribute could be paid to anyone than the sincere attention given his demonstration by the members.

Then came Miss E. Gerhard, of St. Louis, in a demonstration of what to do with a woman's hair—a field that very few men will ever dare to enter. In her talk she carried her audience to her studio and pointed out the location of different lights and her method of using them. Her analysis of her sitters and the smile that ever greets you when you reach her threshold made it easy to understand why the Gerhard sisters have found a place in the sun.

Then a little blarney from out of Bridgeport, Mr. J. P. Haley, the father of that talented young man whose work has received such high praise at this Convention.

Mr. Mock then took the platform to explain that his exhibit was made for fun, not to sell. He had all the fun, as we all thought he was serious when he made them. All great men will have their little jokes. Yet a little further on in his talk he said that he doubted if ever a photographer could become a first-class faker. Then by the aid of a green tube of light and a model he made atonement by showing us his very, very best little line of light, shade, composition and exit.

System was Pirie MacDonald's theme. I won't try to report him. Just a few epigrams that linger in memory:

"The value of a full stomach is far greater than any art."

"If you want to succeed, don't flirt with a brewery."

"Don't work any more than you have to."

"Fill your appointment book for two weeks with names, then retire to a rear room and await results."

"If you want people to be confident of you, be confident of yourself."

"The real way to get rich, is to be poor."

Recess until dinner at 7.30.

A goodly number came to the annual banquet in the ballroom of the McAlpin. That versatile young man, P. Core, gave an astounding exhibition of thought transfer; his ability to concentrate on Philadelphia was startling.

The prize to the lucky lady went to Miss E. Gerhard, of St. Louis. The prize was a silver dish that could be used for either cheese or bonbons.

The lucky gent was Mr. Zackaries, of New Zealand. To his prohibition country he will take home with him a splendid example of an American corkscrew. May it here be recorded, that Mr. Zackaries more than repaid the Society's investment by the laughter he produced in his mirth-provoking impersonation of an amateur actor with a wooden arm.

A few short speeches by the big guns, and dancing until one, brought the end of a perfect day.

Third Day's Session

Mr. Frank H. Cole, of Asbury Park, gave a most instructive talk on efficiency, using as an illustration his wonderful plant for kodak finishing.

W. B. Poynter, of Cincinnati, then demonstrated a flash-lamp of his own invention. The resulting negatives were of a very high order. His ability to make children's pictures was even better than his light.

Then came Pop Core at his very best, for to him was given the pleasant duty of presenting to a highly efficient officer a testimonial of the Society's esteem.

To the retiring President was given a very handsome Howard watch with chain. The President almost responded. The surprise was too great; words he could not find; so he said, "thanks."

The newly elected officers are:

President, F. E. Abbott, Little Falls; Vice-president, J. E. Mock, Rochester; Secretary, E. U. Smith, Honeoye Falls; Treasurer, Edwin Park, Oneida.

Place of next convention, Utica.

CHARLES HALLEN, Secy.

Minutes of the Meeting of the Federal Photographic Society, held in the New National Museum, Friday Evening, March 16, 1917

MEETING called to order by President *pro tem*, Mr. Ludwig.

Resolutions expressing the regret of the Society on the loss of our late Honorary President, Dr. Thomas W. Smillie, were read by Dr. L. W. Beeson. Motion made by Mr. Williams, and duly carried, that the resolutions be adopted as read and that copies be sent to the late Dr. Smillie's sister, Miss Lydia Smillie, 1808 R. Street, N. W., the Smithsonian Institution, the photographic press, the local press, and copies be spread upon the minutes of the meeting.

Mr. Williams then made a few remarks on his association with Dr. Smillie. He referred to

Dr. Smillie as being one of the first, if not the first, to make a telephoto photograph in this country, the photograph being one of the statue on the dome of the Capitol. Samples of a process invented by Dr. Smillie for making photographs on wood for the purpose of engraving were passed to the members present for examination. A water-proofing process which was worked out by him was briefly referred to.

Mr. Stenhouse, of the National Museum, handed to the secretary the following list of fellowships and diplomas which Dr. Smillie held and the societies of which he was a member: First and only Honorary President of the Federal Photographic Society of America; Fellow of the Royal Photographic Society of Great Britain; diploma of honorable mention as a designer from the Columbia Exposition; elected to membership in the Académie Nationale, 1889; diploma of honorable mention from the Cotton States and International Exposition; diploma for photographs of sections of wood from Exposition Universelle de Paris, 1889; medal of third class, Académie Nationale, 1890; diploma, Agricultural and International Fishery, 1898, at Bergen, Norway; grand medal of gold from the Académie Parisienne des Inventions, 1893; commemorative medal from the Jamestown Exposition. Mr. E. J. Pullman, Mr. E. L. Crandall, and Dr. L. W. Beeson then made a few remarks regarding their association with Dr. Smillie.

Mr. Beeson and Mr. Crandall were appointed by the chair to arrange for papers to be read by the members at the April 5th meeting.

A letter from Mr. Harry Fincke, of the Eastman Kodak Co., relative to a proposed lecture on lenses, was read by the president and duly referred to the board of directors.

Mr. Crandall was asked to take the chair *pro tem* by Mr. Williams.

Motion made and duly carried that Mr. Anthony Ludwig preside as president to fill out the unexpired term of Mr. Herford T. Cowling, resigned, as Mr. Linsenmeyer, the vice-president, could not act.

Mr. Beeson, who has been preparing Civil Service Examinations for photographers for some time, then gave a short talk on the preparation of examinations. A general discussion of the subject followed.

A motion was made and duly carried that the Federal Photographic Society offer their assistance to the Secretary of War and the Secretary of the Navy. The corresponding secretary was instructed to write to the Secretary of War and the Secretary of the Navy offering the assistance of the Society.

Motion made and duly carried that the corresponding secretary be authorized to purchase such books as are necessary to keep the records of the Society.

Motion made and duly carried to adjourn.

R. C. TRAYER,
Secretary, *pro tem*.



THE WORKROOM

By the Head Operator



WHEN IS A PLATE FIXED?

THE RETOUCHING TREATMENT OF COPY NEGATIVES
GELATIN AND MOISTURE: A NOTE ON SILVER SPOTS
LONG FOCUS LENSES
GLAZING PRINTS BY STRIPPING
A PHOTOGRAPHIC INK
SORTING AND STORING BOTTLES FOR PHOTOGRAPHIC
WORK
REMOVING FILMS FROM SPOILT PLATES
THE SPEED OF LENSES
TONING FROM BLUE-PRINTS

ON THE FADING OF PHOTOGRAPHS

ON MAKING THE BEST OF EVERY NEGATIVE
SOME NOTES ON THE USE OF HYDROQUINONE
A COMPOUND FIXING-BATH FOR DELICATE NEGATIVES
THE CHOICE OF A COLOR FOR PRINTS
MOUNTING WITH ADHESIVE APPLIED ONLY TO THE
EDGES
CLEANLINESS
BLISTERS IN CARBON PROCESS
CONTROLLING BROMIDE PRINTS
THE OPTICAL PROPERTIES OF LIGHT FILTERS

When is a Plate Fixed?

EVERY once and awhile we see appearing in our journals, among other stock articles, paragraphs on the use of two fixing baths, also stating that when a plate is immersed in hypo the silver is first changed to hyposulphite of silver and sodium, which double salt, while it is transparent, and gives to the plate a transparent instead of a white appearance, still is insoluble in water; and further, that if the plate is taken out of the fixing bath the moment it clears, it will never be free from silver, and that no amount of washing will make it safe. Also that this double salt is soluble in hypo; so it is only necessary to leave it in the fixing bath long enough to effect the solution of this salt; and then comes the proposed use of this second bath, which is used to effect this latter reaction.

The above is perfectly familiar to all readers of our photographic literature. It is copied from one magazine to another, so it is hard to escape it. In regard to the use of two baths, we would say that if the first bath is fit to use at all, then it is good for both purposes. If not strong enough to dissolve the double salt, then it is not good to use for any purpose. The use of two baths reminds us much of the man who, having two dogs, cut two holes in his barn door; a large one for the big dog and a small one for the little dog. The usual advice giving for fixing is to leave the plate in the hyposulphite of soda five or ten minutes after it is cleared, but no definite statement of time seems to be known. The following experiments were carried out for this purpose:

In order to have uniform results, but one kind of plate was used, which happened to be Seed's 26x, probably an average plate. The hypo solution was made with one part of the crystals in four parts water, and a transparent glass upright fixing bath was used, to obtain exact time of reaction.

With four plates which had not been exposed or developed, and were put into the hypo with dry films, it took five and one-half to six and one-half minutes, an average of six minutes, at which time the plates were perfectly transparent, and

each one was transferred to running water as soon as cleared. With plates that had been in the developer, or had been soaked in pure water, it took just one minute longer to clear the plate. This gives an average of seven minutes for fixing plate sufficiently to make it transparent. Thermometer was 65°—and the temperature makes considerable difference; also the make of the plate has much to do with the time of fixing.

The following experiments were undertaken solely to find out how long it took the hyposulphite of silver and sodium to dissolve, and we must say that the results were not what would have been expected from the conventional statements:

Two plates of the four above mentioned were washed in an upright bath for ten minutes, in a strong current of water, and then tested. A silver reaction was at once given, just as we would have supposed; but when the other two plates had been washed for two hours, the result was *not* as we should have expected.

These latter plates, which were taken from the hypo at the moment of clearing, and had simply been washed two hours, were tested for silver; one plate by the sulphide test and the other plate by removing the wet film, incinerating it, reducing in a porcelain crucible and testing the residue for silver, one process being a check on the other. To our surprise, we found these two plates were perfectly free from silver. Then this latter experiment was repeated, giving the same result, and showing that when a plate is perfectly cleared and washed sufficiently long no silver remains in the film.

Now there is no doubt that silver and hypo will form under the right conditions a hyposulphite of silver and sodium—in fact, it forms two salts of this name, one of which is insoluble and the other is soluble. The first can be obtained by adding silver nitrate to hypo solution; the second must be obtained by removing the insoluble salt and precipitating with alcohol.

This first reaction we can see here; the latter is of no particular interest in this connection. To illustrate the formation and reaction of these two double salts we will form and dissolve them

here. In this glass we have a strong solution of hypo, sufficiently strong to readily dissolve the hyposulphite of silver and sodium as soon as formed. In another beaker we have a solution of silver nitrate, which we add to the hyposulphite of sodium. You observe a white precipitate forms, which at once dissolves. This precipitate is a soluble hyposulphite of silver and sodium, and shows clearly that it dissolves instantly and completely in the reagent that precipitated it.

We now dilute the hypo to a weak solution and add the silver again. This time you observe that the precipitate does not dissolve, but quickly turns black, owing to the formation of a sulphide.

Why did we not find silver in the films that were withdrawn from the bath at the moment of clearing? Supposing a double salt has formed, and even supposing it has not dissolved while in the fixing bath, you must still remember that the film is saturated with hypo, and that this is not removed completely for a long time while being washed, which would easily account for the silver being entirely dissolved before the plate is removed from the washing water.

But the truth of this matter is, that if a strong solution of hypo is used there is no double salt formed that is not readily soluble; but where a very weak fixing bath is used there may be danger of the hypo not being in sufficient excess to properly dissolve the silver, and in that case an insoluble salt would form.

The Retouching Treatment of Copy Negatives

PROBABLY one of the most noticeable effects of the war on photography from the retoucher's point of view is the number of copy negatives she gets to work up. At this time there are an enormous number of copies being made, and there is likely to be an increase of number the longer the war lasts. A retoucher, therefore, who can treat these copies skillfully, so as to obtain the best possible result, will be of inestimable value to her employer, and thereby strengthen her own position.

First, let the retoucher see to it that she has the original to work from and thoroughly understands what is required, as a negative for enlargement is treated somewhat differently from one for contact printing, and again, it is not always advisable to spend as much time on a cheap copy, say for a few postcards, as on one from which a good order is to be printed. Excellent work is valued, but in this day of short staffs the best work in the minimum time is invaluable.

The first thing, then, to consider, is the face, and to avoid the usual fault of taking out the likeness. Study your original closely and decide which lines and shadows are essential and which are undesirable or the blemishes of wear and time. It is generally best to leave the lines and features entirely alone and model the skin only with a strict observance to the small shadows, being careful to leave these, or even to accentuate in a faded copy. The skin should be given a fine stipple and any grain worked out. The hair may also be lightened a little, but it must always be remembered that it is a faithful copy of the original that is required, with the addition of

any modern improvement that will add to the attractiveness of the picture without taking from the likeness. Next the figure and background should be carefully looked over and spotted and stippled where required.

So much for a straightforward copy; but very often a figure or head is required from a group, and then more special treatment is necessary as to the arrangement of the background.

Work up your head and figure in the way already described, then refer to your original and plan out your background. We will assume first that we have a full-length figure of a man standing among his companions with one arm partly hidden by one of them and the general appearance of the surrounding objects dark. First, with your pencil draw in the outline of the missing piece of arm, being careful to get your drawing correct. If necessary, take a studio portrait of as near the pose as possible for a copy. Then, with pencil, brush, and knife, make up the missing piece so as to print out as true as possible.

Then proceed to block away the background as follows: Varnish your negative with a good pointed sable brush ("any old brush" will not do) and some reliable opaque, follow the figure very carefully and correctly from the collar to about the knee on the side of your right hand, over the varnish. Now, as to feet, these are most difficult, and if blocking can be substituted by vignetting (in a fairly light ground surrounding the feet) stop here and carry your blocking in a straight line to the right edge of the negative. If the feet must be blocked continue your careful thin line right round the outline of them, turning the negative as you go, and down the other side of the figure as far as the collar. If any part of the face is to be blocked, do this also over the varnish, but the hair and any soft ornament of the dress, such as a sporran or busby, or fur muff, should be treated from the glass side, thus giving a diffused, soft outline, which adds greatly to the correct effect. The blocking is now filled in in the ordinary way, and an air-brush or sketch background on the print produces a pleasing and high-class result.

Should the figure be standing against light objects or the outline be diffused or out of focus, then the best result is obtained by blocking on the glass side, which may be done over matt varnish if desired. But in all cases the line must be correct and clean, or the result must be unsatisfactory.

Do not attempt these delicate achievements while the drymounter, guillotine, or other noisy, vibrating apparatus, is being used at close quarters, for, as the writer knows, the best results are got in a quiet room where the attention is undivided.

Now should a light finish be undesirable, as attained by blocking and vignetting, the exact size of the required print should be obtained and a mask cut to size. Place the mask over the negative and with pencil and brush stipple your background to as near a uniform depths as possible, and take down high-lights with the knife, disguising the surrounding figures as much as possible. For instance, we will suppose we have to take a soldier from a group. He is on the top line, and we could get a good half-length of

him but for a comrade's head, which obscures his belt and the lower part of his tunic. First, with your pencil, sketch out where the belt, buttons, etc., would come behind the head, stipple out the dark hair, eyes, brows, etc., and knife away the face, remembering always the belt, etc., which have to be modelled in at the same time.

For enlarging, knifing should not be attempted by a beginner, but only by a skilled retoucher, as the slightest chipping will have a bad result. Also less diffusion must be allowed for when working on the glass side.

The writer has from time to time turned a lady from a group of two into a curtain, a cake of soap into a shell, a hand on a child's head into a hair ribbon, etc. And it is surprising how very easily and quickly this work is thought out and accomplished when a good assistant's interests are with her employer, and how pleasing the work becomes when the employer's appreciation is not concealed from the employee, but is justly expressed.—W. CHESHIRE, in *British Journal of Photography*.

Gelatin and Moisture: A Note on Silver Spots

EVERYONE knows that when an unvarnished negative is printed on P. O. P., and any moisture has access to the film, soluble salts of silver are transferred from the P. O. P. to the negative and give rise to opaque spots, usually called "silver spots," which are very hard to remove without injury to the image. But while this is recognized, the fact is often overlooked that rain or some other actual wetting is not at all necessary to produce them. Gelatin is a substance which has a great attraction for moisture, so much so that some moisture is almost always present in it, do what we will. Fortunately this minimum quantity is not enough to do harm. But in order to make sure that it is a minimum or sometimes approaching it, either the negative must be dried, or it must at least have been kept in some place that was reasonably dry. If the negative has been exposed to a damp atmosphere for a little while, such as is sure to be found in a room with an open wet sink, the gelatin will absorb an appreciable quantity of moisture; in fact, if the negative is weighed on a good balance and then made quite hot for a few minutes and weighed again, the loss of weight, due to water driven off, can be made visible. So that it is not enough to put the printing frame where it will not get wet. In damp weather, or where the negatives have been kept in a place not perfectly dry, it is a wise precaution to warm them before putting them in the printing frame. If the pads of the back of the frame are also warmed, should there be any suspicion of damp, there is not much risk of the stains arising, unless the paper is left in the printing frame all night—always a risky proceeding.—*Photography*.

Long Focus Lenses

IT is often said that photography dwarfs the distance. This is remedied (says a writer in *Photography and Focus*) to a great extent by the use of a lens of longer focus. The size of the

image of an object on the focussing-screen or plate varies according to the focus of the lens that is used. If, then, we use a five-inch lens from such a standpoint that some near object—say, a figure—is an inch high, we can get that figure still an inch high by going twice as far from it and using a ten-inch lens. But this difference of standpoint, although it has had so much effect on the near object that by using a lens of twice the focus we still only get the figure the same size as before, will be too trifling compared with the distance of a really distant object to make an appreciable difference, so that, as far as the distant object is concerned, the use of the ten-inch in place of the five-inch lens has doubled its size. The effect of moving further off and using a long-focus lens has, therefore, been to double the size of the distant objects while rendering near objects no larger than before. For pictorial work a long-focus lens is nearly always of very great advantage.

Glazing Prints by Stripping

THE method of producing a highly glossy surface by stripping off prints from a polished support applies to prints made on a gelatin paper, that is to say, to P. O. P., bromide, and gaslight. Prints on a collodion paper, such as many of the brands of self-toning paper upon the market, may, by a suitable modification of the process, be glazed by the stripping method, but in this article I shall neglect the collodion papers for the reason that the bulk of glossy prints produced commercially are made on a gelatin paper. Collodion P. O. P. or self-toning paper is almost always used for the sake of the fine natural surface of the paper; there is no inducement to use it for glossy prints when this effect may be obtained more readily and cheaply on gelatin paper.

Hardening the Surfaces of Prints.—One half of the difficulties which are met with in stripping prints is occasioned by the want of sufficient hardness of the gelatin surface. Now that glazing by stripping is a process which is so widely used, many papers, chiefly of the bromide and gaslight varieties, are manufactured with a specially hardened emulsion. Prints on such papers call for no special treatment with a view to easy stripping. On the other hand, many P. O. P.'s and numerous brands of bromide and gaslight require attention in regard to this point, particularly in hot weather, when the gelatin coating is liable to become more than normally softened in the washing baths. One method of hardening prints is to let them become thoroughly dry after the final washing for removal of hypo. They are again soaked in water for a few minutes before laying them down on the glazing plates. But this is a time-wasting method which usually cannot be employed when working upon a considerable scale. It is necessary to make the prints ready for squeegeeing to the glazing plates immediately they are washed free from hypo. Where hardening is necessary, the usual plan is to treat them, for about ten minutes, in 5 per cent. alum solution (1 ounce of alum and 20 ounces of water), or in a bath of formalin of strength of from 10 to 5 per cent., that is to say, 1 ounce of formalin, as purchased, in 10 to 20 ounces of

water. The cheaper alum bath is actually preferable when working in quantity, since the vapor given off by formalin baths in constant use is apt to prove irritating, if not injurious to the nasal organs. It is, however, not difficult to arrange for the bath to be placed where the vapors from it are carried off into the outer air. In the case of alum it is important to use a pure material; much cheap alum is contaminated with iron. Such alum is liable to act quite positively as a reducer of P. O. P. prints; also, there is the danger of irregular blue stains on bromide or gaslight prints which have been sulphide-toned. Perhaps, in the case of development papers (bromide and gaslight), as good a plan as any is to do the hardening at the same time as fixing. The bath for this purpose is made up with chrome alum, soda sulphite, and sulphuric acid, in addition to the hypo. I gave the formula for this in a previous article (*British Journal of Photography*, January 3 last), but may repeat it here:

Soda sulphite, crystals.	2 oz.
Water	6 oz.

This solution may be made with aid of heat, but sulphite dissolves best at a temperature of about 100° F. When dissolved add the following mixture, which should be prepared by adding the acid to the water, not *vice versa*, and leaving to cool:

Strong sulphuric acid	2 fl. drams
Water	2 oz.

This mixture of acid and sulphite is then poured into a solution of:

Hypo	16 oz.
Water	48 oz.

and addition finally made of:

Chrome alum	1 oz.
Water	8 oz.

This gives a fixer containing 4 ounces hypo in 20 ounces. It is suitable strength for bromide and gaslight papers, but I should prefer the plain alum bath after fixing in the case of P. O. P.

Materials on which to Squeegee.—The materials with which to produce a glazed surface are glass, enamelled ferrotype plate, and celluloid. Of these there is no doubt that glass gives the finest gloss, while, short of occasional breakage, the glass plates may be kept in use for years without replacement. Both ferrotype and celluloid give a high gloss, and have the advantage—which may be great in certain circumstances—of lightness. A large number of ferrotype or celluloid plates bearing prints may be hung up from lines or light laths quite easily, whereas, in the case of glass plates, a much more substantially built rack or staging would be necessary. Thus, in the case of a large batch of glazed prints being undertaken in a business which was not regularly doing such work, ferrotype or celluloid would probably be found to lend itself more readily to the job than glass. The ferrotype plates may now be obtained of large size and enamelled on both surfaces. Celluloid sheets are sold chiefly in the form of the well-known "squeegee pads" of the Altrincham Rubber Company. Each sheet of

celluloid is sandwiched between a pair of thin rubber sheets, which serve as a protection of the prints when the latter are being squeegeed down, and also provide a ready means of suspension of the celluloid when hanging up to dry.

Preparing the Surface.—The first essential to ready stripping of the prints is perfect cleanliness of the glass or other plates. When taking glass plates into use it is well to let them pickle in a mixture of about three or four parts of water with one part of strong nitric acid. They are then well flushed with water, given a scrub over with hot soda solution, again rinsed, and may then be taken to be as clean for the purpose as they can be made. Celluloid or ferrotype plates must not, of course, be treated in this way, but such preliminary cleansing is not necessary, the plates being suitable for use after the final preparation to be now described.

The plates, of whatever kind, now require to be cleaned and polished. The polishing materials generally used are either French chalk or a solution of wax. French chalk is the older method, but one still adhered to by many photographers. A little is dusted over the plate, well rubbed over the whole surface, and then lightly dusted off again with a clean duster, which, as it picks up French chalk in use, is relegated to the first duty of applying the chalk and a clean duster taken into use for the dusting off. The alternative cleaning preparation is a solution, such as beeswax, 20 grains, in turpentine, 1 ounce; or spermaceti wax dissolved, in the same proportion, in benzole. This is rubbed over the plate with a piece of flannel, and polishing then done with a soft silk duster or a piece of chamois.

Some workers prefer to place the polished plate under water when placing the prints upon it, but there is no real necessity to do so, so long as air bells between print and glass are thoroughly expelled by the use of a squeegee, which will give a firm and even pressure. The squeegee may be of either the roller or bar variety, but whichever it is it should be of ample size and of good quality resilient rubber. Perished rubber will fail to make the necessary contact, and, moreover, will tear the prints.

Drying the Squeegeed Prints.—So long as the prints are not exposed to a temperature which causes the gelatin coating actually to soften, the more quickly they dry the better for readiness of stripping. On the commercial scale, where work has to be got out in the minimum of time, it is customary to provide a drying cupboard fitted with racks to take the glass plates, and provided with an artificial draught of warmed air. An average time for the drying of a whole batch of prints on their glasses in such a cupboard will be from half an hour to three-quarters. In default of a special drying cupboard, prints are placed in a well-ventilated room, in which they will dry, as a rule, within a few hours. With proper preparation both of prints and glasses the glazed prints should drop off at a touch, or at any rate should require only the slightest pull to remove them from the plates.

Glazing Solutions.—Of late years a much more rapid and, at the same time, highly labor-saving method of glazing prints has come into use by the introduction of special solutions into which the

prints are simply immersed for a few minutes on removal from the wash water, and are then laid down immediately and squeegeed to the glasses or ferrotypes. Several brands of this form of preparation are on the market, and the method is certainly most valuable to workers on both a large and small scale.

Matting Prints by Squeegeeing.—Although the chief purpose of the squeegee and stripping method is for the glazing of prints, it may be used in precisely the same way for producing a matt surface on prints made on glossy paper, employing as the temporary support for the prints either ground glass or matt celluloid. Some amateur workers have preferred the matt obtained in this way to that produced on a matt paper, but, personally, I think there is nothing in it. If I were required to produce a batch of matt-surface prints I should think I was wasting my time by using the method while the choice of almost endless degrees of mattness in commercial papers is now available.—*British Journal of Photography*.

A Photographic Ink

A GOOD reliable ink for writing on photographs, which may interest some readers, can be made up with the following chemicals, thus:

Potassium iodide	10 parts
Iodine	1 part
Gum arabic	1 part
Water	30 parts

The resulting ink will produce white lines on the background of the photograph.

Sorting and Storing Bottles for Photographic Work

THE photographer who is also a practical economist will find it a good plan to carefully examine all bottles which pass through his hands, and to keep all that are likely to be of any service in connection with his photographic activities. The bottles to be kept should be thoroughly cleansed, dried, and then classified according to shape and size. Bottles having comparatively wide open tops, and varying in capacity from 1 to 4 ounces, are particularly useful for chemicals in the form of crystals or powder. Small bottles with narrow necks are worth saving for small quantities of solution; they can also be converted very easily into "drip" bottles—a valuable adjunct to any dark-room equipment. Special bottles of green or blue glass, and either hexagonal or octagonal in shape, should be reserved for acids and for solutions of a poisonous character. The go-ahead camera man of the present day often needs to purchase comparatively small quantities of chemicals, either for experimental purposes or for special work. In such circumstances a good stock of clean, ready for service bottles, from which one of the exact size required can be instantly selected, will not only prove to be a source of gratification to the owner (by preventing confusion and loss of time), but will also save the twopence, threepence, or fourpence—as the case may be—which the photographic dealer, in view of the

prevailing restricted output of all kinds of glassware, will be well justified in charging. For a long time past it has been the practice in the writer's household, before any bottle, jar, or other receptacle has been finally disposed of as apparently of no further value, to submit it to him, with the question, "Is this of any use to you for your photographic work?" The practical value of this simple domestic courtesy has been amply confirmed in practice, and the plan is accordingly commended with confidence to the attention of other workers.—*Amateur Photographer*.

Removing Films from Spoilt Plates

IT is often required to remove films from spoilt plates for printing from roll-film negatives, trimming prints, cover glasses for slides, passe-partout, and other purposes when it is necessary that the glass should be quite free from scratches. It will be found that if the spoilt negative is taken from the fixing bath, and put straight aside to dry without any washing, when dry the film may be easily stripped from the glass by one corner. Old negatives may be given a hypo bath, and treated in this way with the same result. The above, though simple, is quite effective, and is one of the easiest ways of doing this job, and certainly has economy in the materials required to commend it.—*Amateur Photographer*.

The Speed of Lenses

$f/4.5$ is 1.137 times faster than $f/ 4.8$
$f/4.5$ is 1.234 times faster than $f/ 5.0$
$f/4.5$ is 1.548 times faster than $f/ 5.6$
$f/4.5$ is 1.960 times faster than $f/ 6.3$
$f/4.5$ is 2.777 times faster than $f/ 7.5$
$f/4.8$ is 1.085 times faster than $f/ 5.0$
$f/4.8$ is 1.361 times faster than $f/ 5.6$
$f/4.8$ is 1.723 times faster than $f/ 6.3$
$f/4.8$ is 2.441 times faster than $f/ 7.5$
$f/5.0$ is 1.587 times faster than $f/ 6.3$
$f/5.0$ is 2.250 times faster than $f/ 7.5$
$f/6.3$ is 1.417 times faster than $f/ 7.5$
$f/6.3$ is 1.613 times faster than $f/ 8.0$
$f/7.5$ is 2.230 times faster than $f/11.2$

By carefully working this out, you will be able to find the speed of the lens which you are using, and how the speed of one compares with another. Better keep this; it will be worth something to you some time.—From *AnSCO Co*.

Toning from Blue-prints

ACCORDING to Th. Sommer, if a platinum-black tone is desired, the print is bleached in the following freshly prepared and filtered bath:

Water	350 c.c.	10 oz.
Borax	8 gm.	120 gr.
Ammonia (stronger)	8 c.c.	$\frac{1}{2}$ oz.

Then place it in a saturated solution of gallic acid until the desired tone is obtained. Wash again and dry.

For violet-black tones the blue print is first

treated with a 5 per cent. solution of borax and then placed in

Water	500 c.c.	1 pint
Tannin	15 gr.	$\frac{1}{2}$ oz.
Gallic acid	15 gr.	$\frac{1}{2}$ oz.

For sepia the following is used:

Water	100 c.c.	3 oz.
Tannin	4 gm.	60 gr.
Hydrochloric acid	8 drops	8 drops

For use, this solution is diluted to 1 part to 50 of water, and the print is immersed in it from one to five minutes; it is then washed and placed in a 5 per cent. solution of potassium carbonate until the desired tone is reached.—*Photo-Well.*

On the Fading of Photographs

THE cause of fading in photographic prints can be traced to a number of sources, one well-known source being the imperfect elimination of the fixing agent in the case of silver prints. Hyposulphite of soda as a salt is very soluble in water in almost any proportion, moderate washing of the prints in several changes of water will rid the prints of this salt; but the chemical that is formed by the hyposulphite of soda acting upon the organic compounds of silver is not got rid of so easily. This salt is the *hyposulphite of silver*. This product is easily decomposed by the action of light; it possesses a sweet taste; and if allowed to remain within the body of the paper it will soon cause the rapid fading of the print.

It is this salt that gives the greatest trouble to eliminate. Prolonged washing, especially by changing the prints from tray to tray of clean water, is the surest way to get rid of this dangerous element.

The use of a weak bath of common alum has often been suggested as a remedy to counteract this chemical, but the remedy in this case is worse than the disease, because an element is introduced of an acid nature that will assuredly cause fading, especially with gelatin emulsion papers. The after washing of any such print must be increased by many more changes; even then they are not reliable.

Many thousands of beautiful prints have been ruined, and quick fading set in, by the use of cardboard mounts that have contained traces of hyposulphite of soda, this latter material being largely used by paper manufacturers as an antichlor, as it is termed; that is, to correct the effects of chlorine and its compounds in the bleaching process. Although considerable attention has been given to the production of pure cardboard for photographic purposes there is a very large quantity employed for photographic mounts that is as impure as it is possible for a cardboard to be. This is brought about by the low prices in competition, particularly in the production of enlargements. The larger the prints the more common and impure the cardboard appears to be. Upon testing the water in which strips of this cardboard have been allowed to soak, hyposulphite of soda can be detected readily. It will not matter how much the prints may be washed previous to mounting when the cardboard mount contains such injurious im-

purities, there will be left no chance or condition for the lasting of a photographic print. Even the whites of a perfectly produced platinum print will soon become yellow, and although the print itself does not fade, the print as a picture will become ruined and unfit for exhibition.

A very unusual and unaccountable fading of a photographic print that the writer experienced five years ago was in the case of a burnt-in photograph upon a porcelain plaque. The print was made upon a collodion film prepared upon paper, with a chlorocitrate of silver emulsion, the print was carried to a considerable depth and toned in a solution of chloro-platinite of potassium, in combination with potassium oxalate, slightly acidulated with citric acid. The print was made from a good negative of a child. When the toning was complete the image was fixed in a solution of hyposulphite of soda and thoroughly well washed, and the film removed from the paper by a bath of hot water. It was then floated upon the porcelain and adjusted in position and dried. The process of burning-in took place, the image was covered with enamel, and, although it was a little weak, it presented a fine appearance. In the course of a few days the image seemed to be disappearing. This was thought to be imaginary. Such, however, was not the case. For at the end of fourteen days the portrait had entirely disappeared, leaving nothing but a block of pure white enamelled porcelain. Whatever may have been the true cause of this strange and unusual phenomenon, no attempt was made a second time to carry out the platinum toning of the image with the acid oxalate solution. A collodion transparency, made upon glass and perfectly toned in a solution of chloride of platinum, acidulated with a few drops of sulphuric acid, is one of the very best means for producing a photograph for burning-in with a certainty of no fear of fading.

Atmospheric conditions will affect a photograph if exposed long to its action. Many specimens that are exposed in the showcases of photographers are examples of this. The prints that show the least action in this direction are those made in carbon. Any trace of sulphur in the atmosphere will affect any print that has been made with the salts of silver, no matter how minute the fumes may be, either of sulphur dioxide or sulphuretted hydrogen. These gases will attack the ordinary photograph and cause a yellowing all over the print. The action once set up continues until the print as a picture is completely spoiled.

Another source of fading prints is one that the photographer least suspects. This is in the water that is used for washing the photographs. If the water contains any saline substances, these are sure to remain in the prints after they have dried down, and lay the foundation of sure fading. Much as the idea might be ridiculed, the right thing to do in such cases would be to give the last two washings in clean rain water, or even distilled water, to be sure that no salts remain in the print. Ordinary water from the faucet could not be used to wash a daguerreotype plate, because of the trace of saline and organic matter that would spoil the finished picture with spots and tear marks.

One of the prominent sources of fading is the employment of a paste or mountant that is liable to acetous fermentation. It will be found upon examination of many prints made a year or two previously that there are a variety of streaks and markings all over the print, which are clearly visible through the paper as brush marks. This is due to the imperfectly made paste or mountant—paste that has been improperly cooked—the result being brought about by the starch granules becoming fermented by atmospheric moisture, thus setting up what is called acetous fermentation. No matter how slight the quantity of acid generated, the print will start to fade and continue to do so until it becomes unrepresentable and not fit even to copy.

The above remarks apply not only to prints made with the salts of silver, but to every kind and description of photograph. If fermentation sets in at the back of any print the paper will also become affected. There are many very fine prints existing today that were made by the hot-bath platinum process, that have not been mounted, the whites of which have become yellow or degraded by age alone. This must not be considered as fading in the usual sense of the term, because all paper will become affected by time. As far as the platinum image is concerned there is no change whatever in the platinum deposit. The rich, velvety black still exists, which proves this class of photograph to be of a very permanent character. When an acid is present the fading is due to the oxidation of the image.

Many photographers have observed the imprints of the hand, particularly finger-marks upon a photograph after it is finished. This is due to the acid condition of perspiration of the hands during the process of mounting. It will interest many photographers to know how easily they can put this to the test. If the person who mounts the prints perspires moderately, take a piece of blue litmus paper, touch the perspiration with it. In an instant the paper will turn red. Or if the finger is pressed upon a piece of blue litmus paper by the person mounting the prints, and held there for a short time, a perfect imprint in red will be produced upon the test paper. This is due to either uric or lactic acid, or both, especially if such person suffers from rheumatism. When any large-size prints have to be dealt with it is a very good plan to wipe the surface of the print after the fourth or fifth change of water. Place a print, say 11 x 14, upon a 14 x 17 sheet of glass, take a tuft of absorbent cotton and wipe the surface of the print with the cotton in a wet condition; treat each print in the same way, while a stream of water is still running upon it. This certainly removes many little impurities that cling to the more or less viscous surface of the print, at the same time produces no injury whatever, but ensures the removal of surface impurities that cannot be removed by the ordinary method of washing. Upon examining the tuft of cotton this will become apparent, for it will be observed that a considerable quantity of organic matter adheres to the cotton, while at the same time the removal of the hyposulphite of silver has been greatly assisted and the whites of the print improved.

It has been remarked that even a carbon print will fade, after a short exposure to light and air. This is only true when there is a trace of the salts of chromium left in the paper, due to either careless manipulation or a want of correct knowledge of carbon printing. If the carbon print, previous to mounting, is placed into a 5 per cent. common alum solution, for a few minutes, and then washed well in several changes of water, there will be no signs whatever of fading or a change of any description. The writer possesses carbon prints made in 1873 that are as clean and perfect in every particular as they were when made, thirty-four years ago.

As a surface protector for every kind of photograph, no matter what kind it may be, whether colored or not, the use of amyl-acetate collodion cannot be too strongly urged. The use of this material does not alter the character of the print at all, but protects it from all atmospheric gases, damp or oxidation. A coating of this material will preserve a photograph in such a manner that nothing else will do. For the benefit of those who wish to prepare this article the following formula is given. The print can be coated either before or after mounting, and what is more, a photograph so treated may be wiped with a piece of wet absorbent cotton and cleaned without fear of injury to the print.

Amyl-acetate Collodion

Gun cotton (pyroxyline)	400 gr.
Amyl acetate (concentrated)	10 oz.

Shake this well, then filter through a lightly-made plug of clean washed-out cheese-cloth, pressed (not tightly) in the neck of a clean glass funnel; filter this twice, when it will be fit for use.

Should the collodion be too thick it can be thinned down by the addition of a small quantity of amyl-acetate. Allow the prints to dry spontaneously. Coat them at night, the next morning they will be fit for delivery. If any spotting is required, it must be done before coating the print.

On Making the Best of Every Negative

Printing Control

THE quondam lively controversy between the "straight printers" on the one hand and the "control printers" on the other has almost passed out of today's memory, and gone to join its ancestors who battled royally over the legitimacy of retouching or local after-treatment of the negative. These disagreements are amusing in light of the fact that the battle in each case raged over a bogey which, like Mrs. Gamp's friend, "Mrs. Harris," did not exist. In our case the bogey was that a good or "technically perfect negative" was itself a faithful and true record of a long scale of tones, and that the print was an equally faithful transcript. As a matter of fact, the truth-telling power of negative or print is considerably restricted if compared with quite ordinary conditions in nature.

In the making of a photographic print we are limited, on the one hand, by the whiteness or light-reflecting power of the paper, and, on the

other, by the blackness or darkness of the image-forming material. In the case of a platinotype or a very good bromide print, this is a range of about 33—or say 30—to 1. That is to say that the darkest part of the picture reflects about $\frac{1}{30}$ as much incident light as does the white paper; or the high lights are 30 times lighter than the shadows.

Now, in nature it is not a very unusual thing to see a near (foreground) dark tree trunk in the shade along with freshly fallen snow in the open distance. This is a contrast range considerably beyond that of our 30 to 1 paper. In fact, it is probably something like 200 to 1. If our near dark object be the open mouth of a deep cavern, reflecting back still less light than the tree, it will probably be a range of 300 or 350 to 1. It is clear, then, that, were our negative capable of giving a range of, say, even 100 to 1, our printing paper would let us down with many of our natural subjects if a faithful, *i. e.*, literally true, record be our aim or standard.

Thus, with the best possible negative and longest range printing paper, we are likely to find ourselves ousted from the palace of literal truth with all our natural subjects, except those limited to a range of about 30 to 1. These we should regard as flat, tame, and often quite uninteresting.

But this is not all, by any means. For suppose we have a natural subject showing, let us say, a moderate range of 100 to 1, *i. e.*, a row of patches graduating from light to dark, the former reflecting 100 times as much as the latter; what can our technically perfect negative give us? Perhaps the first ten or twenty darker patches are indistinguishable in the negative, *i. e.*, under-exposed, and at the other end the highest ten or twenty may be all one flat and even density in the negative, leaving us a short central range fairly satisfactory. But when we come to print this central best part, perhaps its range goes outside the possibilities of the paper; and further, the differences of the tones of the print at either end will show a falling off similar to the negative. Thus the perfect negative and perfect print (*i. e.*, literally truthful) are for the most part myths. Therefore the war about the untouched negative and the straight print is futile.

We have therefore to regard the matter from the real or practical side, keeping in view our limitations. One or two simple experiments will give us a good foundation or start. Take an ordinary rapid plate, and at a fixed distance from a steady artificial light in the dark-room give it a series of graduated exposures, each being just double or half its neighbors—*e. g.*, 1, 2, 4, 8, 16, 32, 64, 128, 256, 512, 1024, etc., seconds at such a distance that the central part of the series is likely to give us some easily distinguishable densities. Develop this strip fully, *i. e.*, as long as 1 shows no change, or action ceases in the central part. Fix, wash, and dry this strip negative and print it. If the print shows eight distinguishable consecutive steps, it is recording a range of differences corresponding to a light range of 128—or say 100—to 1. If, on the other hand, it only gives you a range of six steps, your illuminative range is limited to 32,

say 30 to 1. In the light of what has just been said, you are more than likely to find either the first few steps, 1, 2, 4, etc., or the latter, 512, 1024, 2048, etc., indistinguishable in the negative and in the print. Likely enough your strip negative may fail at both ends, though in opposite ways. Abney, Hurter and Driffeld, and others have shown that we cannot follow in faithful relative proportions of different natural luminosities with the densities of our negatives over more than a comparatively short range of Nature's keyboard of light and shade tones. In other words, our negative lets us down one step, and the print still another. Surely, then, where is the need for defending the imaginary infallible untouched negative and straight print?

Both the negative and print are only means to an end, and, like the printed page, are at best only conveyers of thought and feeling, of ideas and emotions. Thus the best print is the one which best conveys the message of the sender, *i. e.*, the artist, who has seen and felt things which he desires to convey to others.

This brings us to the very practical point of our aims in making the negative (*i. e.*, exposure and development), and selecting the printing paper and making the print.

Now, although our strip negative just mentioned is not very attractive in appearance, it is nevertheless a useful, practical aid in examining and comparing the printing response of various papers, gaslight, bromide, P. O. P., etc. The foregoing diagram may perhaps aid the less experienced worker in selecting this or that kind of printing paper for special consideration. It is convenient to group all negatives into classes. We have here taken six classes as being sufficient for all practical purposes. Opposite these six classes are vertical lines showing the most responsible process for such negatives. Thus, for example, if developing for contact printing on rapid or ordinary bromide paper, we should aim at producing negatives of the C or D class; or, again, having produced a negative of the B or C class, we should select gaslight for contact or bromide for enlarging; while if our negative came into D or E classes we should most likely get the best result with a matt silver paper, or carbon, and so on. As a matter of fact, what we call control is largely but not entirely a matter of influencing light and shade contrast. Fortunately we can compensate for errors of judgment in the making of our negatives by a discreet choice of printing paper as just shown, and also by a discriminating choice of strength of light. This may help to explain to the beginner why in this diagram we have given each type of paper at least two classes of negatives. Thus, suppose we wish to use "gum bichromate," and our negative is of the B class, we shall print in a soft or rather weak light; while if the negative be of the C class a more vigorous light may be used.

Again, much in the way of general lightness or darkness, apart from contrast, is under easy control, either by more or less printing in the print-out paper or by modified development in the other papers, and also suitable exposure.

Contrast, again, is a matter of relation between two things. This relationship can be modified

by altering either the one or the other, or both. Take the sky and land part of a landscape, for example. To reduce contrast we can darken the sky, or lighten the land, or influence both. Thus in local treatment, intensification of one part may be equivalent to reduction of another part, the wiser choice of either procedure depending on the general consideration of the case. Hence from the foregoing and other considerations the reader will rightly infer that as each case requires its own special treatment, one should have a well-furnished armory from which one may select the most suitable weapon.—*Amateur Photographer*.

Some Notes on the Use of Hydroquinone

THE high price of the developing agents has brought forth the question of the propriety of using hydroquinone alone for practical work, and consequently photographic journals are besieged by inquiries as to the advisability of its use disjoined from the other agents with which it is almost universally associated for ordinary portrait work.

The value of hydroquinone for securing great intensity of image goes without saying; but, as portraitists do not favor density and look for a medium which furnishes a variety of half-tones in the image, now the question asked is, Can one get with hydroquinone alone a good differentiated negative?

We premise by saying that hydroquinone possesses no tendency to abnormal development, and hence there is no reason why it may not be advantageously employed *per se*. But it requires special humoring, so to say. The various restrainers employed with pyro, etc., perform with hydroquinone the same function, indeed, in a more pronounced manner, and just here lies the crux of the problem; an injudicious use of bromide of potassium may call down undeserved anathemas upon it.

One peculiarity of hydroquinone is that under-exposures have a tendency to stain with protracted development. The stain is more liable to occur when soda is the energizer than with potash. But this happens also with pyro.

The tendency to stain is lessened and practically avoided by increase of the content of sulphite.

The effect of bromide is to retard, more so than with pyro, and so particular care must be taken not to dose with the bromide. A minimum quantity of bromide adds to the clearness of the image, as well as to increase of gradation, and is also sufficient to prevent fog.

This dosing indiscriminately with bromide is the main reason why it is not generally employed alone, because of the harshness of the image resulting. It would follow from this that it is not advisable to use hydroquinone developer over and over. The use of caustic alkalies is advantageous in shortening the time of development, and it is also of advantage to use a more dilute developer; that is, add more water.

A good proportion for developer is formed of 2 grains hydroquinone and 6 grains of caustic potash to each ounce of developer with 30 grains of sulphite, taking caution as to the use of bromides. Never allow the developing solution

to fall below 70° F. Hydroquinone not only works most tardily, but often is inert at temperatures below 60°. Stain is invariable at temperatures below 70°.—*Bulletin of Photography*.

A Compound Fixing-bath for Delicate Negatives

FIXING the negative, yes; did you ever study that simple yet very important part of the photographic process?

Have you not often noticed how the highlights are eaten away when the negative has become what is called completely fixed? And have you not noticed how differently a properly made new fixing-bath works compared with an old one? More than this, have you ever observed how different the quality of a negative is when it is fixed in plain hypo and when it is fixed in an acid hypo bath?

All the delicate qualities, so necessary in a negative, are very often eaten away in the acid fixing-bath, while they are retained in the negative that was fixed in the plain hypo.

The acid fixing-bath was devised particularly with the idea of hardening the gelatin film at the same time that the fixing was performed: An advantage, it is true; but when a negative is required that must possess and retain all the fine detail in drapery without loss, the plain hypo fixing-bath has proved to be unapproached. Some five years ago I tried a fixing-bath for negatives that was said to increase the density or to intensify the negative at the same time that the fixing operation was in progress. This bath had as one of its component parts protosulphate of iron. As a fixing-bath it was a complete failure in my practice, and I found, upon inquiry, that it proved to be the same in the hands of others.

For the past year I have been using a very simple fixing-bath that retains all the delicate details in the negative without any eating away of any portion whatever; at the same time a very faint acid reaction is indicated by blue litmus paper and a slight hardening takes place at the same time without the use of either the common or chrome alum or formaldehyde. Now, it is always considered that results count, and as good results have been given by this particular fixing-bath, it is here published for the benefit of other photographers besides myself whose aim is to secure the best negatives possible:

Water (warm)	64 oz.
Sulphate of magnesia (Epsom salts)	4 oz.
Hyposulphite of soda	20 oz.

It is not necessary for the water to be hot, and the mixing may take place either in a large glass bottle or in a stoneware pitcher.

When the sulphate of magnesia and hyposulphite of soda are dissolved, the liquid should be strained through muslin, owing to the presence of both chips and dirt, which must always be kept out of this fixing liquid, so as to aid in securing the best results.

This fixing liquid has been used continuously at 75 and 80° without any detriment, the sulphate of magnesia acting as a mild hardener without interfering with the fixing properties of the hypo.

No frilling has ever taken place with this fixing-bath, although the changes of temperature have been sudden, from fixing to washing. Negatives fixed in this lose no detail whatever, either in the high-lights or the shadows.

The fact must not be overlooked that the composition of the fixing-bath has a great deal to do with the resulting color of the negative, and the color has a marked influence upon the resulting print.

To get the right kind of print, one that will render the texture of everything artistically, it is necessary to produce the right kind of negative; the fixing-bath has as much to do with the result as the developer. The tendency I have always found in this particular fixer is to bring about a soft negative, although the developer may have been the means of the production of considerable contrast.

Any sediment that may be formed should be separated by either decanting or simple filtering.

When it becomes sluggish in action it should be cast among the other waste solutions for throwing down the silver, and a new bath made without delay.

The Choice of a Color for Prints

THERE are the proverbial three courses open to a photographer in the choice of the color in which he will make his print. (1) He may ignore the color of the subject absolutely, as is usually done in a plain black-and-white print. (2) He may select a color in which the color of the original is suggested. (3) He may match the color of the original exactly. Putting on one side the various three-color processes, it is evident that the third course is only possible when the subject is a monochrome one; since the very simplest arrangement of colored objects in nature contains colors that are blended in too complex a manner to be imitated by any photographic method of local toning, inking up with various colored inks or the like. It remains to decide whether the prevailing color shall be suggested or ignored.

In doing this, we are met by the fact that, in a great many of the subjects with which the photographer deals, there is no one color so pronounced as to be entitled to the term "prevailing." Even when there is a large area of some strong tint, as in the case of landscapes, where we may have two-thirds of the total area in one or other of the many shades of green, there is nearly always to be found some very decided touch of another color where green does not "prevail," as, for instance, in the blue of the sky or the yellow or brown of earth, fallen leaves, buildings, etc.

When this is the case, if we choose for our picture a color which suggests the green of the landscape we shall have a green representing the blue of the sky or the yellow of a building, and the more effectively it will do the one the more conspicuously unsuitable will it be for the other. Hence we see that for a great many landscape subjects a green picture would be quite out of keeping. This is generally recognized, as can be seen at any exhibition, where the prevailing tone of the landscape pictures will be found to be black or a cool brown, which in this respect is much the same as black.

There are a few landscapes which are so nearly monochromes in green that a greenish tone may be adopted with them. In such cases it will not do to adopt a definite green color for the picture, as there are sure to be widely varying shades of green in the subject, and if we endeavor to hit upon a match for one of these we shall be far wrong with many of the others. But, by choosing a greenish black, we may suggest the green character of the picture generally without inviting the thought that we have tried to get the color itself and have failed.

A class of landscapes for which a distinctive color is often used is that of snow scenes. Although there are in most snow pictures distinct areas of warm color, these colors are often not decided enough to make the use of a cold color impossible. A snow scene is often improved, therefore, by being printed in some tint which suggests the prevailing tint of the subject—blue or green. Here, again, we must guard against the use of too decided a shade. A plain blue or a plain green, by challenging comparisons, is to be avoided, but a bluish or greenish black will be free from this objection.

There is something a little incongruous in the use of a sepia or a warm black for snow subjects, although for the deeper shadows the tone may not be amiss. The high-lights in snow are usually so free from any suggestion of yellow or red, at least of that particular yellow or red-brown which we see in the high lights of a sepia picture, that this tone of print should be avoided for this particular purpose. It is one of the few classes for which sepia is not as suitable as plain black.

Another of these classes includes what purport to be moonlight pictures. Here there is in nature an almost complete absence of warm tones; even bright scarlet flowers in the moonlight look almost black. A bluish black tone is, therefore, very suitable, but not the greenish black which is sometimes used, for which there seems to be no justification.

Sea pieces are in another class. Here a greenish tone is not unsuitable; but, once again, it should be greenish black rather than green, and a greenish black quite distinct from that which might suit some landscapes. Warm brown and sepia are generally out of place for such subjects.

Coming to portrait and figure work, we have a group of subjects for which warm colors are decidedly to be preferred to cold. Black—pure black, that is—is permissible, as indeed it is for all subjects without exception; but, if we make any departure from this, it should be in the direction of warmth—brown or red, rather than towards blue or green.

For very light, dainty work, in which what draperies there are are white, red chalk or Bartolozzi red on paper with a slight cream tint is suitable, more from its delicacy than from any suggestiveness of the color. But when the draperies or accessories are heavy this is not usable with success, and one does best by keeping to the deeper shades of brown, sepia, etc.

Nothing has been said about a purple tone, such as is sometimes called "photographic purple." Were it not for the fact that it has to some extent come to be accepted as the photographic color *par excellence* it would hardly be

tolerated. It is essentially an artificial color, by which is meant one which is used because the process gives it, and not for any special merit or suitability of its own; and it is apt to appear gaudy and crude. It is perhaps to be classed with the pink and mauve tinted papers which the professional finds it necessary to use for clients of a certain type, but which have no justification in art. They are not to be employed voluntarily.—*Photography*.

Mounting with Adhesive Applied only to the Edges

MOUNTING is an operation in which there is great risk of spoiling an otherwise good print. I do not write of dry mounting, which, when the necessary apparatus is available, seems to be as near perfection as anything can be got; but of mounting as it has to be carried out with the means which are at the disposal of the average amateur photographer. These generally reduce themselves to a pot of starch paste or some ready-made adhesive, a brush, and some sheets of newspaper.

The difficulty which most of us experience lies in the apparent necessity for applying the paste over the whole of the print. To get this to be quite flat, not only must it be pasted all over, but sufficient time must be given for the paper to absorb moisture from the mountant and become limp. The result is that as it dries it contracts, and causes the mount to curl. Drying under pressure, and drying with the mounted print bent into a convex form, print outwards, have been suggested as methods which get over this inconvenience; but at the best they are not very successful, for if the mounted print is left lying loose afterwards it soon curls again.

An alternative is to apply the mountant at the edges only. It is not at all difficult to do this neatly, and it at once gets over the cockling trouble. The greater part of the print being quite dry when it is mounted, there is no contraction with its inevitable bending. Even the edges which are pasted need not be very limp. I have mounted all my prints in this way for several years now and should be sorry to have to go back to the paste-all-over method again.

The mountant used may be one of the pastes which are specially made for photographic purposes—there seems to be very little to choose between them, and I buy whichever happens to be in stock. They are better than home-made starch paste, as they contain less moisture than this.

A stencil brush—a round brush with very stiff, short bristles in a metal holder—is best for applying the adhesive, although at a pinch this can be done with the finger tips. The necessity for wiping them clean each time prolongs the operation, however, and is wasteful of mountant. I tack a big button flat on the end of the brush so that it will stand firmly, bristles upwards, when it is not actually in use.

For mounting prints that are all approximately the same size a piece of zinc or tin plate a quarter of an inch smaller each way is very handy; it should have a strip bent and soldered to one side of it like the handle on the lid of a saucepan.

When the prints vary much in size, a piece of newspaper may be cut for each to answer the same purpose.

To mount a print it is placed face downwards on a pile of clean newspapers or similar material. The metal plate, or the paper, is put on it, so that an equal width of the print extends beyond it all round, and a thin but even coating of the mountant is given with the brush to this margin all round. The brush should be moved lengthwise in the direction of the margin, but slightly outwards all the time to make sure that none of the mountant gets under the edges. As soon as the mountant is applied all round, the plate or paper is taken off, the print raised, put down on its mount, lightly rubbed into contact, and put away under pressure to dry. I usually shut it up in a book. The top piece of paper is then removed from the pile and thrown away, and another print put in hand.

If the precaution is taken of having prints and mounts normally dry before mounting them, which will be the case if they are spread out in the room for half an hour or so previously, they will not only be flat when removed from the pressure, but they will remain flat afterwards.—*Photography*.

Cleanliness

THE trained chemist has a very different idea of cleanliness from the ordinary individual, and photographic work being essentially chemical, it behooves those who aim at even ordinarily good technic to fully study this term from a proper standpoint.

If you were told by some photographic writer to use a clean glass measure for some purpose, you would probably give it a rinse or two under the tap and feel thoroughly satisfied. A chemist, in cleansing the measure, would give it two or three rinses in water, using a test-tube brush or some other article, and finally give it a couple of good rinses with distilled water. Such precision is unnecessary, you say. Well, it may be nine times, but the tenth time it may be just that thoroughness which enables the chemist to get the result you strive after and never seem able to obtain.

This week I am going to give brief directions, then, for thoroughly cleansing dishes, measures, troughs, and so forth, feeling quite sure as I write that you will find them useful, and their strict observance more often than not beneficial to your work.

The easiest dishes to keep clean are the white porcelain or "granitine" ones, which have a glazed surface of excellent resisting powers. When developing gaslight or bromide papers in such dishes, however, black stains eventually make their appearance, and require removing. A small piece of flannel and some "Dutch Cleanser" soap or "Sapolio" will enable you to do this; but a much more rapid and effective cleanser will be found in nitric acid, which instantly dissolves them. A few ounces of commercial nitric acid should be kept in a glass-stoppered bottle, in the dark room, for cleansing purposes, but care must be taken in using it not to get any

on the fingers, as it burns the skin and makes it brown.

After a dish has been rinsed with nitric acid it should be given five or six good rinses with tap water, so as to completely remove all traces of the acid.

Dishes which have been used for M.-Q. and other developers, or in which fixing solution has been standing, will be found to have a rough feel, which washing does not remove. This roughness is due to a sediment which is insoluble in water, and an acid is the best means of removing it; the acid need not be strong, however—one part of either nitric, sulphuric, or hydrochloric acid in ten parts of water dealing with it effectively.

The sides of glass measures in which a developing solution has been standing become similarly covered with this deposit, and a little weak acid will be found to dissolve it away immediately.

Sometimes a sediment will form on the sides of a bottle, and nothing seems to remove it, so that we are inclined to think "it will not matter." Such a refractory bottle can be dealt with by filling it about one-third up with water, and putting a tablespoonful of small shot in it; the cork or stopper is then replaced, and the bottle vigorously shaken. The friction caused by the shot soon disintegrates and removes the sediment.

Fixing and washing troughs made of glass or porcelain, with grooves, require constant attention. The grooves should be cleaned out periodically with a test-tube brush, as slime and filth accumulate readily in them.

A last word as to the state of the dark room bench or table must be said, as a dirty bench is the cause of endless trouble, though it is so rarely suspected. In rocking a dish, say containing hypo, a little of the solution comes over the edge, and is allowed to dry on the bench. A wet glass measure containing developer is next day stood on that spot. It is hastily taken up, and the contents poured over a plate to be developed; a drop of wet from the outside—contaminated with hypo—also finds its way into the dish, and then "something happens."

Wash and wipe your bench constantly; wipe the outsides of your measures and dishes whenever you have washed them; and do not keep the same rag or duster in your dark room for twelve months or more—have it washed regularly as well.

Blisters in Carbon Process

THE carbon process holds a position midway between what may be termed *straight* printing processes and those admitting control of values, such as gum bichromate and the oil-pigment process. With any process it is, of course, quite possible to control values by means of hand work on the back of the negative or by local shading of the negative during printing, but with gum and oil the values may be controlled during development while the picture, as a positive, is under the worker's hand. This kind of control is not possible in P. O. P. or platinotype, and only slightly so in bromide by means of subsequent local reduction. It is in this respect that carbon

may be considered an intermediate process, for while the film of pigmented gelatin is nothing like so amenable to fractional reduction of depth as is the case with the film of pigmented gum, it is yet fairly easy to lighten tones which may be too heavy by the cautious use of a pledget of wetted cotton or a camel-hair mop. This advantage, together with the fact that a great variety of colors of tissue may be employed, and at the same time a number of different surfaces of transfer paper used as supports, makes the carbon process a very desirable one for the pictorial worker, yet there are difficulties in the way of successful working which require to be overcome.

Selection of Transfer Papers

A good deal of difficulty may be avoided by a careful selection of transfer paper. If the surface is what is desired, choose a thinner paper in preference to a thicker one, the thinner paper being easier to saturate with water prior to squeegeeing down the exposed tissue. A fairly soft paper, too, is preferable to a very hard one, less vigorous squeegeeing being necessary to secure perfect contact over the minute inequalities of paper surface. The character of the gelatinous sizing should also be noted, and it is well to soak a sample of the transfer paper in hot water—say, at a temperature of 130° F.—and notice carefully how the gelatin behaves. After some little time the transfer paper may be taken out of the water and surface dried between blotting paper, and the gelatin rubbed with the ball of the finger. If it remains firmly on the paper it will probably work satisfactorily, but if it readily rubs up almost in a moist, powdery way the transfer paper may be regarded with suspicion. The gelatin is poor, or has been allowed to remain heated for too long a time when the sizing has been done. Better a little additional sheen on the surface of the print than no print at all on account of blisters.

Air in the Transfer Paper

Reference has been made to the necessity for saturation of the paper before squeegeeing down the tissue. With thin, smooth papers, fifteen to thirty minutes' soaking in cold water is an ample allowance; but the air in a thick paper cannot be dispelled in so short a time, and with some of the thicker drawing papers a soaking of two or three hours is necessary. This expelling of the air is expedited by laying the sheet of paper on the squeegeeing slab, allowing cold water from the tap to run on to it, and rubbing it over with the flat hand with some slight pressure. This not only dispels any minute surface air-bells, but the pressure forces air out of the spongy paper. This may be done two or three times during soaking and immediately before putting down the exposed tissue. The soaking may be shorter if warm water, say 80° F., is used, but the transferring must naturally be done in cold water.

Condition of the Tissue

Blisters are of two kinds, large and small. Those due to air on the surface or to air in the

substance of the paper, plus a poor character of sizing, are usually small—at all events, not bigger than a ten-cent piece. But large blisters sometimes occur, so large and so numerous that almost half a print will come away from the support. These may usually be traced to the tissue rather than the transfer paper. Overprinting, printing in the sun or too near an arc lamp, so that the tissue becomes partially insoluble from the action of heat, stale tissue, tissue sensitized at home and dried in an impure atmosphere, any of which produce, at all events, surface insolubility, and prevent satisfactory adhesion of tissue and transfer paper.

The same thing will sometimes occur where there are large areas of heavy shadow, especially if the negative is too strong and very full printing becomes necessary to secure detail in the high-lights. In the last instance the remedy is obvious—softer negatives must be produced, and the existing negative either reduced with persulphate or the shadows softened by the aid of mineral paper and stumping sauce. In other cases avoid heating the tissue during printing and take care to use only tissue which before printing is in a perfect condition of solubility. The point may be readily tested by slipping a bit of tissue into water of 80° to 90° F., when the gelatin should melt within half a minute quite freely.

Development

The usual instructions are to develop in water at a temperature of 110° F. With rough papers much greater safety is ensured by commencing with the water very much cooler—say, 70 to 80°. If the tissue is in good condition, the negative not too strong, and the proof not overprinted the back should readily peel away in a short time, and the temperature may be raised if and as necessary, but, of course, very gradually. Not only are blistering risks minimized by this method, but if printing is on the light side there is a better chance of saving the print, and the worker always feels that he has something up his sleeve in the way of increased temperature should that be necessary. The readier solubility of the gelatin, too, enables local lightening to be readily carried on, and a good deal may be done in the way of concentration and the introduction of accents without that risk of dragging away the film from the single transfer paper which exists more or less where printing has been carried so far that development at a much higher temperature is necessary.

Occasionally a transfer paper is met with which shows a tendency to blistering as soon as the print is subjected to a change of temperature, and with such a paper it is not possible to stop "bleeding" by slipping the print into cold water. As soon as development is seen to be complete, the print must be placed at once in the alum, and if this is quickly done there is not much risk of any "bleeding" being hardened and causing smeary markings.

Controlling Bromide Prints

UP to the date of the introduction of Sterry's process the methods of controlling gradation in bromide prints were not very satisfactory, nor

were they easy of manipulation. With ordinary care and cleanliness it is within the power of the average photographer to produce a perfect print by this method. The great feature of this process is the fine gradation to be obtained, and the softening of contrasts. Nor is this all. Where we have to reduce to monochrome a wide range of colors, as in complex flower studies, we can obtain pictures with a much truer gradation than it is possible by straight exposure and development.

The process is extremely simple. All we have to do is to soak the exposed but undeveloped bromide paper first in water for two or three minutes; then in a bath of bichromate of potash for a few minutes; rinse in two changes of water to wash out excess of the reagent, and finally develop in the ordinary way.

The first thing to be done is to make up a stock solution of bichromate of potash. It does not matter if a few crystals of the salt remain undissolved at the bottom of the bottle, as this only shows that the solution is saturated. From this we can make up baths of varying strength.

Next (if using an unfamiliar bromide paper) we take our negative and make a series of exposures to determine the time necessary to obtain perfect detail in the high-lights. No notice need be taken of the shadows being overprinted, as the bichromate bath will keep back the development of these when we make our final prints. The necessary exposure having been discovered, we make a trial exposure, and cut it into strips, taking in portions of the highest light and the deepest shadow. Next we take our stock solution, and from it measure out carefully, say, half a dram, and make up to ten ounces with cold water. Place the exposed strip in a bath of cold water for two or three minutes—this I find is rather an important step in the process, as unless this is done the bichromate bath seems to act unevenly on the emulsion, and may lead to unsightly stains appearing on the finished print—and then transfer to the bichromate bath. Leave it in this for four to five minutes, then rinse twice in clean water and develop as usual. Personally I use amidol for preference, as toning with sulphide or hypo-alum works best after this. Development is retarded, but it is advisable to go on until the detail comes up in the high-light. Now rinse quickly and fix in acid hypo. The acid is important here because it will remove any yellow stain left by the bichromate bath. When fixed, remove the print to a well-lighted room, and examine it side by side with a straight print from the same negative. It is probable that the result will be a considerable improvement on the straight print. However, if it is not entirely satisfactory, baths of greater strength can be made up from the stock solution, and further trials made with the exposed strips reposing in the drawer.

Having determined our exposure, and decided on the strength of our bichromate bath, we make a final exposure and develop and fix. Then compare this result with the straight print. It is important that the final washing should be thorough. In this way we can obtain extraordinary differences in our prints.

The negative which I used in making my trials of this process was, I thought, hopelessly spoilt

by stains produced by my having attempted local reduction. But my astonishment was great when I discovered that all signs of the stain were nearly obliterated by the adoption of this process.

The conclusions that are to be drawn from my results are:

1. By this process we have a means by which great softening in contrast can be obtained, the scale of tone gradation being greatly improved.

2. We can obtain greater detail in the shadows than we could without it.

3. In subjects in which we have to reduce to monochrome a wide range of colors we can obtain a correct rendering, although we may have, on our negative, overexposed for the whites and blues, and more correctly exposed for the reds, yellows, and greens.

4. In landscape subjects, where we have on the same negative a good sky with a fine cloud detail, we can keep back the development of the landscape until we have brought out the sky detail.

5. From a negative which is badly stained we can get a good clean print.

In conclusion, let me add a word of caution: When working with this process, or indeed any other in which bichromate salts are used, it is advisable that the operator should wear rubber finger-stalls. If the solution gets into any small cuts or abrasions in the skin, ulcers are apt to form, which are very slow in healing.

The Optical Properties of Light Filters¹

IN discussing the optical properties of light filters for use in photoengraving and color processes the subject is divided by the author into two parts: (a) the optical properties of perfect filters; (b) the optical properties of imperfect filters. Under the first division mathematical expressions are given for the two principal aberrations suffered by light in passing through a plane parallel filter, namely, curvature of field and spherical aberration. Numerical application is made to the most unfavorable case occurring in practice. The results found prove that no detrimental or even sensible action occurs. Difference in magnification due to the use of filters of different colors is next considered. It is found that for red and blue filters the difference is of the order of one part in five thousand, or negligible. Compensation for this can be secured by making the filters of slightly different thicknesses. In testing imperfect filters, the author made use of a telescope of long focal length, and a test object formed of illuminated squares. Photographs of the appearance of the image with imperfect filters interposed are given. The effects of poor grade glass, cylindrical curvature, and cell pressure are shown. In examining high grade filters, a resolution test is used. Finally formulæ for change in magnification due to filters of different thickness, and to filters having spherical boundary surfaces forming a lens of power dP , are deduced, and verified by means of actual tests in a specially designed optical apparatus.—C. E. K. MEES.

¹ Communication No. 41 from the Research Laboratory of the Eastman Kodak Company (abstract).

PATENT NEWS

Under this heading it is proposed to include each month a list of all the U. S. Patents; and brief abstracts of the more important, and to include also such foreign patents as present special features.

Copies of any patent can be obtained from the Commissioner of Patents, Washington, D. C. Price, five cents each.

- Camera. J. A. London. 1215290.
- Camera Device. J. P. C. Granger. 1215142.
- Cinematograph Apparatus. J. Lahrmann. 1214789.
- Photograph Case. J. P. Koller. 1215036.
- Mounting Photographs. C. W. Laurell. 1215170.
- Camera Device. J. A. Maker. 1214936.
- Coloring Photographic Images. H. Miller. 1214940.
- Film for Color Projection. A. Keller-Dorlan. 1214552.
- Shutter. R. Klein and T. Brueck. 1215284.
- Shutter. P. J. Marks. 1214699.
- Photo-micro Apparatus. R. L. Watkins. 1214851.
- X-ray Apparatus. W. D. Coolidge. 1215116.
- Folding Camera Bed. W. A. Riddell. 1215412.
- Camera Device. G. T. Lwintig. 1216021.
- M. P. Device. A. S. Howell. 1215534.
- Range Finder. R. E. Green. 1215647.
- Method of Making M. P. Films. H. W. Webb. 1216026.
- M. P. Machine. G. D. Brady. 1215770.
- M. P. Device. J. F. Gilmore. 1215364.
- M. P. Shutter. A. D. Standeford. 1215887.
- M. P. Screen. E. G. Meadway. 1216154.
- Camera. C. Bornmann & E. C. Clark. 1216543.
- Camera Indicator. C. Voigt. 1216631.
- Projection Screen. J. F. R. Troeger. 1216380.
- Film and Producing the Same. L. Lilienfeld. 1217027.
- Film Clasp. J. R. Dunavant. 1216967.
- Developing Apparatus. J. S. Greene. 1216440.
- Lighting Device. R. John. 1216696.
- Print-toning Apparatus. P. M. Taylor. 1216748.
- Printing Apparatus. W. C. Huebner. 1216318.
- Film for Color Photography. C. Raleigh and W. V. D. Kelley. 1216493.
- Method of Taking Motion Pictures. R. John. 1216695.
- Projection Apparatus. A. Ames, Jr. 1216910.
- Projection Apparatus. A. Ames, Jr. 1216911.
- Projection Apparatus. A. Ames, Jr. 1216914.
- Projection Apparatus. L. G. Morris. 1216835.
- Stereoscopic Device. L. T. E. Colardeau and J. Richard. 1216948.
- X-ray Tube. J. B. Wantz. 1216633.
- Camera Back. C. F. Speidel. 1217653.
- Camera-focusing Attachment. W. Ehrlich. 1217728.
- Winding Device for Cameras. A. Hardy. 1217444.
- Time Release for Cameras. H. H. Parsons. 1217493.
- Color Cinematography. C. N. Bennett. 1217391.
- Color Photography. C. Raleigh and W. V. D. Kelley. 1217425.
- X-ray Apparatus. E. W. Caldwell. 1217148.
- X-ray Apparatus. E. W. Caldwell. 1217149.

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PITTSBURG SALON, 1917
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THE PITTSBURG SALON, 1917

By W. H. PORTERFIELD

JUST how many years have elapsed since the term pictorial photography was first applied to that class of work which, by reason of the difference in quality and effect, was distinguished from the work that had formerly graced our exhibition walls, it is quite impossible to say; but there was a condition apparent as far back as eighteen ninety-five or six which might, without serious chances of error, be termed the turning-point.

Previous to that time the glossy print with its microscopic detail expressed the photographer's highest achievement, with nothing more to be desired, particularly if his landscapes possessed clear white skies and his portraits bore no traces of flesh tones or subtle shades of modeling, which then would have been condemned as faulty development of plates or a mistake in printing.

If one was particularly ambitious and aspired to exceptional rank in the art he could always, if a person of means, add to his prestige by using a camera of extreme

size, carrying an anastigmat lens with a title that would overwhelm an Indian potentate. This combination never failed to elicit expressions of awe, and never sold for less than several hundreds of dollars, and on that fact hung many reputations.

"Good pictures," those days, were always blamed on the lens, the photographer modestly claiming credit only for the muscular equipment that enabled him to carry the outfit and set it up. Any favorable result was "luck," for he never, never would promise that "they would come out good."

The photographer of twenty years ago was ready, generous soul that he was, to promise one "a copy of the negative, and delighted when it was accepted. He would rarely accept payment for such a trivial service as "striking off a print," because he was "only an amateur," though it is not on record that the law-abiding amateur had any such courtesy extended him by the stockdealer.

(185)

Photography is not less a mechanical science today than it was two decades ago, but by infusing into the work the personality of the photographer and by applying principles long known to the students of art the pictorialist has brought about a change in the product of the camera which first deserved and later won recognition at the hands of the connoisseur.

It is not sufficient in the year of our Lord nineteen-seventeen that an aspirant for honors in the photographic world shall know only his camera, lens, and chemicals, though a knowledge of these things is essential if he would advance beyond what is now considered only the elementary stage of the work.

Pictorialism in photography, as it is practised today, takes no cognizance of of "under-exposure," "over-exposure," "full-timed" negatives, and all the technical absurdities which spelled success or failure in the old regime, for at best they are but relative terms. Today the print is accorded recognition only in so far as it conveys the effect which the maker tells you he endeavored to secure, and the verdict of the present-day jury is rendered in accordance with the evidence as presented in the print. Simplicity in art is, like brevity in wit, the soul of it, and to him who tells his story most effectively and with the least apparent effort the palm is awarded.

No better evidence of the immense strides which camera work has made is more convincingly demonstrated than at the Fourth Pittsburg Salon held during the month of March at the Carnegie Institute.

Of the two hundred and eighty-three pictures that constitute the exhibition there is not one that would offend the most esthetic taste.

The Salon has grown in dignity from year to year, and one is conscious that the pictorialist of the camera is very much in earnest and that calmness and deliberation and study have superseded the old "shoot-at-sight" policy, and as a result we have pictures instead of—well—the things we used to make.

The six pictures by A. D. Chaffee, of New York, evidently done in one of the oil processes, are marvels of the printer's

art, and possess qualities which would make them eligible in any exhibition of monochrome productions. No. 44 in the catalogue, entitled "Concarneau, Brittany," is a masterpiece, not only in composition but in every element which distinguishes high-class work. Each of the five remaining prints is no less beautiful, though delightfully varied in character and artistic conception.

Alice Choate, also of New York, has the honor of introducing the one novelty of the show, a design in black-and-white in which a handbag, a box-cover, and other commonplace articles are woven into a most interesting pattern. 'The "Colonnade" and "Colonnade Detail," by the same artist, are magnificent prints and among the best work of the exhibition.

George Alexander is represented, as in former years, by a collection of gum prints which shows good treatment of the lotus flower, an unique bird-study, and a picture of swans.

Elizabeth R. Allen, of Moorestown, N. J., invades new fields for her 1917 salon material. Two excellent figure-studies and three pictures of sand dunes with effective clouds, representing "Morning" and "Evening" and the effect of wind on the sand, tell her story of a visit to "The Lonesome Land."

"The Cabin by the Pond" is a delicate landscape by M. Howard Arbogaste, of Wilkesburg, Pa.

"Birch-tree Lake" and "Japanese Lady and Birch Trees," by Charles K. Archer, of Pittsburg, are satisfying wood interiors.

Three portraits by Philip McCutcheon Armstrong, of Detroit, possess many admirable qualities, though their beauty is somewhat diminished by light areas at or close to the margins of each print.

C. E. Beeson, of Pittsburg, sends two prints: "At the Ford," an excellent landscape, showing the harvesters returning from the fields, and "His Majesty," a study of a bronze lion, a difficult subject well done.

George C. Bell, of Newton, Ia., is represented by three portraits, semi-professional in appearance.

"The Sheriff," by E. W. Binkley, Mill Valley, Cal., is a true western character

and is convincing without being grotesque.

"The Shadow," "The White Sail," and "Historical Building, Buffalo," by David W. Bonnar, are three prints in beautiful tone and decorative quality, No. 24, "Historical Building" ranking well up with the best in the show.

Benjamin J. Boyd, of Wilkes-Barre, Pa., has a good rendition of rain and mist effect in No. 25, "The Shower."

"The Spanish Gypsy" and "Interior, Rothenberg," by A. A. Breed, are both above criticism.

"Boston Harbor—Evening," is easily the best of Rupert Bridges' four prints. It is beautiful and sympathetic in color, quite the opposite of No. 29, "The Bathers," which lacks those elements. No. 32, "The Indoor Garden" is a difficult figure subject well handled.

Will D. Brodhun's single entry, "The Wind Break," is one of the good things of the show. This artist has created an effective picture out of a few tall trees which stand guard over some delapidated-looking houses.

"A Portrait," No. 34, by Margaret De M. Brown, of Brooklyn, shows a young woman in a white dress standing before a dark curtain, effectively throwing into relief the delicate tones of the dress.

Gertrude L. Brown, of Evanston, Ill., is represented by two prints, a "Colonial Doorway" and "In the Sunlight," both of which are resplendent in atmospheric effect and artistic perception.

The prints of John C. Burkhart, Portland, Me., of which there are four in the Salon, contain many praiseworthy features, yet all suffer more or less from over-printing and the use of an unsympathetic medium. No. 42, "The Kimona," is good in arrangement but too dark in color.

F. F. Christine II, of Philadelphia, sends "A Scene from Normandy," a landscape, pleasing in composition and notable for fine atmosphere effect.

"Apple Blossoms," "A Study," and "Day Dreams," by Katharine Bruckerseifer, of New York, are disappointing when one recalls the beautiful prints which this artist sent to the nineteen-sixteen Salon.

C. W. Christiansen's three prints are

all of Niagara and represent the great falling water from unusual view-points. The treatment is strongly individual and characteristic of this worker's control of the carbon process.

A little more simplification in the background of Louis S. Clark's "The Lilies" would have greatly enhanced the pictorial qualities of this print.

Ernest L. Crandall, of Washington, D. C., is very creditably represented by his strong landscape, "The Approaching Storm."

Francis W. Cowell, of Little Falls, N. Y., makes his first appearance as a Salon exhibitor with four admirable prints. A strong portrait, the "Beach Gossips," an early morning harbor-scene, and a Japanese treatment of a park bridge are convincing evidence of this worker's pictorial ability.

One always expects something full of light and sunshine from Dwight A. Davis, and his two prints, "A Fantasy" and "From my Window," are faultless examples of his artistic genius.

W. A. Dick, of Pittsburg, in "A Gray Day" shows good treatment of a commonplace theme.

The "Children of the Hill District," by James N. Doolittle, of San Francisco, is poetic and original and the best of his group; while "A Break in the Storm," "Where Nature Smiles," and "Languidly the Blue Pacific Casts its Silvery Ripples," are decorative landscapes of exceptional merit.

Charles H. Davis' collection of outdoor figure studies are ambitious though somewhat lacking in accentuation, with the exception of No. 73, "Gathering Dogwood," which leaves nothing to be desired. "The Mirror," by the same artist, combines a figure study and portrait, the latter seen by reflection.

"An American-Italian Garden," the work of Charles W. Davis, of Pittsburg, is a picturesque subject expressed in an unfortunate color.

Four prints by Edwin G. Dunning, of New York, are all good and in keeping with this worker's reputation. If any preference could be expressed, it would be in favor of No. 87, "Dickie's Breakfast," a very charming semi-silhouette of a woman intently watching a caged bird.

John Paul Edwards, of Sacramento, Cal., has been a consistent exhibitor at the Salon since its inception. Each year has witnessed a steady growth towards bigger and better things. In the present exhibition he is represented by six pictures, two of which, "A Vale in Arcady" and "Weird Grove of Death," are Dante-like in effect, while "A Decorative Landscape," "Uncle Silas," and a "Scene on the Sacramento River" complete an especially strong group of prints.

Another of the prints which might well illustrate a scene from Dante is "The Ancient Wood," by W. H. Rabe, of Oakland, Cal. One marvels at the Doréesque effect in illumination. "A Village Street" of foreign character, "The Laurel Grove," "An Arabian Nights Landscape" and a "Misty Morning," all by Mr. Rabe, are excellent pictures.

W. G. Fitz, of Philadelphia, has a good draped-figure study in "Lorelei," a street scene in "South Penn Square—Winter" quite out of the ordinary, and a masterly illustration in "Hassim Seeks the Genii of the Rock."

Most prominent in point of value among Louis Fleckenstein's five pictures is the "Rose Dance of the South," a well-posed figure in costume.

John Wallace Gillies, of New York, takes for his theme the ancient "Archer" and classic "Discus Thrower," posed with appropriate settings. Each picture is beautiful and complete in itself, and as a series are unsurpassed by anything in the Salon. One regrets, however, that a very ordinary snow-scene should have been included in this collection, as it is strikingly incongruous and lowers his otherwise high average.

"San Domocile" is the better of four prints by Louis A. Goetz, of San Francisco. This is closely followed by "Atala," of theatrical effect, and by "The Fireside," while No. 114, "Defiance," requires deeper printing to make it effective.

William A. Guyton, Jr., of Chicago, sends two interesting prints, "A Wooded Hillside," showing a flowering dogwood tree, and "Caprice," a gnarled and twisted survivor of the orchard.

Ordinarily one does not associate snow with Arizona, yet Ferman Hanna, of Globe, shows one print, "The Brook—Winter," with exquisite values, good arrangement of detail, and unquestionably the best of its kind in the Salon.

No. 118, "The Street Repairers," by G. H. S. Harding, of Berkeley, Cal., is an interesting genre, though slightly too dark in foreground.

"The Live Oaks" and "Eucalyptus Trees" are two landscapes by Thomas R. Hartley, of Pittsburg; both rich in color and good in tonality, lighting and composition.

That one need not journey afar in order to find material for pictures is proven by the work of Agnes B. Hawkins, of New York, who asks for nothing but a sprig of bitter-sweet, a water-glass, and a figured curtain, and out of these articles creates a design of exceeding beauty. A "Portrait of Miss W," by the same exhibitor, is refined and pleasing in every respect.

Antoinette B. Hervey, also of New York, has one exhibit, "The Bride," a delicate print in simple tones which has decided claims to notice.

If the single picture sent by Herbert M. Hilton, of Brooklyn, entitled "Through the Gates," is characteristic of his work, it is hoped that next year's Salon will contain a more liberal representation from this worker.

George B. Hollister, of Corning, N. Y., attains his greatest height in "Pierrot," a decidedly clever rendition of a subject which seems essential to the completion of all photographic salons. In "Italy" and "The Hill Country" Mr. Hollister treats outdoor subjects satisfactorily.

Usually the title of a picture does not detract from its artistic value, yet "Sunset—Cape Cod," by Bernard S. Horne, of Princeton, N. J., would carry greater conviction if rechristened moonlight or moonrise, Cape Cod. The tone of the picture is decidedly night rather than daybreak.

W. A. Hudson, of Los Angeles, Cal., who last year scored a pronounced success with studies of California missions, is similarly represented this year and with equally as commendable work.

From Meyers R. Jones, of Brooklyn,

come "Miss Saucy" and "The Monk" of the Capuchin monastery; the former a faultless costume portrait, and the latter, though a much photographed subject, is still interesting when done so well.

R. S. Kaufman has never appeared to better advantage than in the present Salon. Five of his six prints, all outdoor compositions, are most creditable, while the sixth loses much in value on account of the denseness of color in the foreground. "The Laborers," No. 142, tells of man's work in life's humbler occupations and is Kaufman's best work.

In his first appearance at the Salon Arthur F. Kales, of San Francisco, advances well to the front with six open-air figure prints. Good judgment and a knowledge of the possibilities of the art are displayed in every picture. A nude, entitled "Lost," is effective in pose and lighting and one of the best works in the show.

The four portraits by T. W. Kilmer, of New York, are overpowering in size, and though technically excellent in every particular, impress one more as professional successes than as pictorial achievements.

Stepan de Kosenko sends only a single specimen of his work, a "Portrait Study" whose richness and beauty create the desire for a deeper acquaintance with his work, and it is hoped that future exhibitions may be thus favored.

There is a distinct difference between the prints of Francis Orville Libby and others found on the walls of the Salon, and one is likely at first glance to pronounce against his big, dark masses and absence of detail, until a little better acquaintance is made with the strength and breadth which makes Libby's work quickly recognized wherever seen. No. 158, "The Glowing Dusk," is wonderfully luminous, and its extreme simplicity and happy choice of color effect an illusion seldom met with in photography. The other prints are characteristic, and the collection as a unit shows great improvement over the work in former exhibitions.

"The Distant Shore" and "Landscape—Evening," from Arthur S. Little, of Ventura, Cal., are pleasing, and show appreciation for atmosphere and values.

"Beeches," by George P. Loth, of Cincinnati, is a good picture of trees with interesting marking.

The Salon contains one gum-print in color, the work of Dr. R. S. Lovejoy, of Portland, Me., "Diana Rides the Night." The new crescent is seen correct in size, properly placed for the time of evening represented, while the mysterious effect of night is well expressed in the color combination used.

William Ebert Macnaughtan, of Brooklyn, is the author of four prints that make an instant appeal to the lover of all that is dreamy and poetic in art, "The Concord Bridge" and "Landscape," so Tryonlike in quality and romanticism, will remain long in the memory of those who are sensitive to the subtle beauty that earns for Macnaughtan's prints a place by themselves.

In the initial appearance of Margreth Mather, of Los Angeles, the Salon finds another strong pictorialist from California. "The Stairway" and "A Lady" are prints that abound in excellent taste and reveal in the maker a highly developed sense of pictorial appreciation.

W. C. Mellor, of Pittsburg, advances both in number and quality of prints over his representation of last year. "Contentment" is an admirable study of figures at a window, and "The Coming Shower" is a good landscape. "Mother Love," No. 172, in the catalogue, is satisfactory in composition but slightly extreme in diffusion.

"The Old Stone Bridge," by Reuben Miller, Jr., of Pittsburg, is a difficult subject handled with artistic skill, in which the choice of a sympathetic printing medium gives the effect of an old mezzotint. "A Mountain Evening" is likewise full of feeling and well warrants its title.

Strong in character and unquestionably a true portrait is "Grandmother Malcolm," by Alexander P. Milne, of Portland, Ore.

Harvey W. Minns, of Akron, O., is seen at his best and in unmistakable Minns style in "Poise" and "Portrait of Mrs. Green."

Claude L. Moore, of Buffalo, has an agreeable landscape in "A Lazy Brook." "Cathedral Street—Baltimore," by H.

Remick Neeson, is notable for its interesting play of lights and shadows, while his "Portrait of a Lady" and "A Neopolitan" are worthy examples of technical excellence.

The influence of Baron de Meyer is felt in Clifford Norton's "Bridal Wreath," a still-life study of a Bisque figure and budding twigs that possesses a peculiar quality of shimmering light seldom seen in a photograph.

"When Thieves Fall Out," by Harry C. Phibbs, of New York, is a picture quite out of the ordinary. The source of illumination is cleverly concealed in the center of a circular group of figures, the nearer figures in deep shadow accentuating the light that plays on the faces of the opposite group. This is one of the real pictures of the show. "The Drinking Song" and "Peasant Madonna," by the same contributor, are too contrasty and not equal to either the "Laughing Cavalier" or "Figure Study."

O. C. Reiter's greatest work for photography is of a nature that does not admit of its appearance on the walls of the Salon. Throughout the year it is his duty, with the assistance of his associates, to carry on the business of the enterprise, and this work on several occasions has consumed the time which he otherwise would have devoted to pictures, and undoubtedly with the same success witnessed in the four prints which we find under his name this year. "The Brook—Early Morning" is delightful in the pearly atmosphere effect so peculiar to woodland scenes in the early hours of day. "An Old House by the Roadside," the subject of another print, is a "homey" old place nestled under big trees, while "The Fountain" and "Play Time" are well-arranged figure studies perfectly described in their titles.

Mrs. William H. Rau, of Philadelphia, sends "Roses," a large print of beautiful quality and pleasing composition, which shows a young woman absorbed in admiration of the flowers named.

Few exhibitors have told their story so well as Jane Reece, of Dayton O., in her two prints, "The Head of Achilles" and "The Torch Bearer," while hanging close by is "The Mystic," by Margaret Rhodes, of Chicago, a head that has much

the appearance of a wood-engraving in good quality.

L. M. A. Roy, of La Crosse, Wis., places his Indian figure against a sunset sky and succeeds admirably in "The Last of His Race."

All of D. J. Ruzickas' pictures, except one, deal with scenes in and about New York. "Lower Broadway," "The River," "Erie Basin," and "The Brooklyn Bridge" are shown with true consideration, which has made them (and their author) so well known. "Sunrise," a solitary figure seated by the water's edge, and "Park Lake," complete his very attractive exhibition.

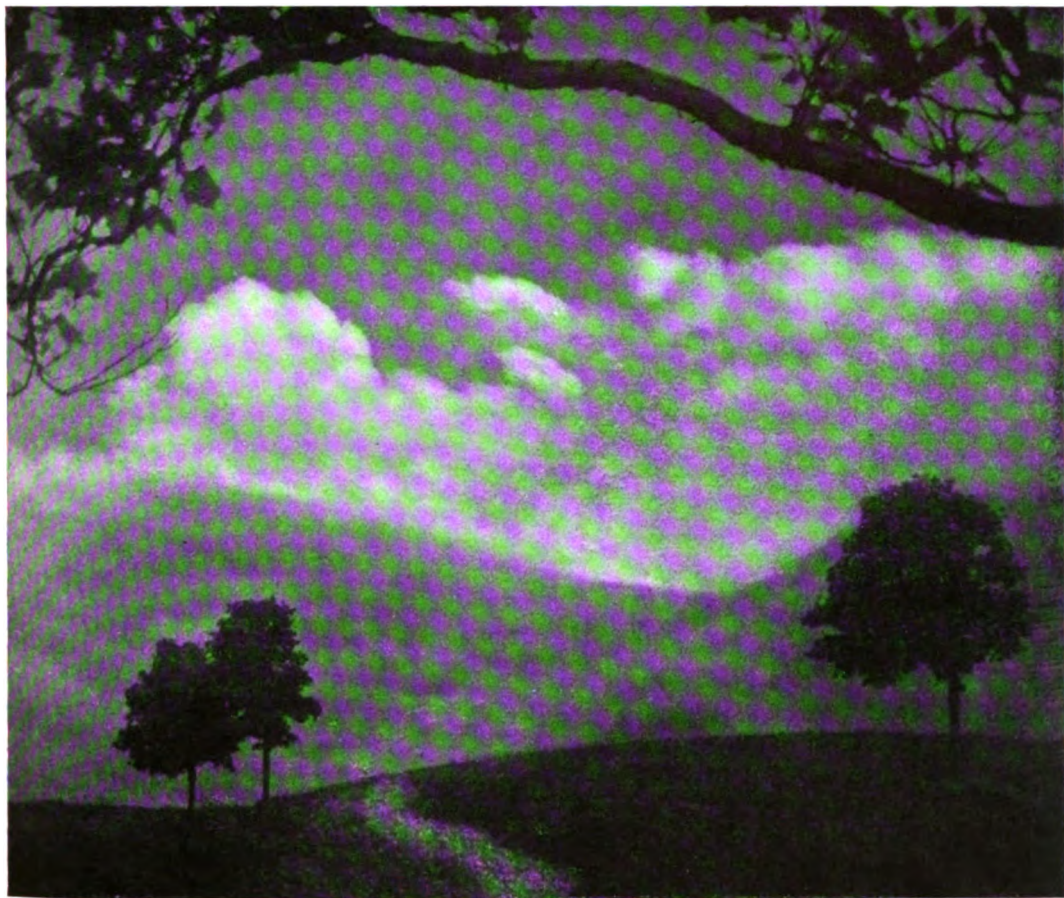
Nunya Seldes, of Pittsburg, whose work in the nineteen-sixteen Salon was received with great favor alike by press and public, maintains her former standing in only one print this year. No. 230, "Head Study," is in every way a most creditable portrayal of an Arab-like head. "Brooding" and the "Witching Hour" are unpleasant in color and devoid of the quality which distinguished this worker's previous efforts in pictorialism.

Thornley Seabrook, of Franklin, Pa., is eminently successful in his portrait of a young girl with appealing eyes, and a like appreciation is due Otto C. Schulte, of San Francisco, for his No. 225, "Portrait of a Young Girl." "The Presidio Gate," also by Mr. Schulte, shows the Panama-Pacific Exposition and the San Francisco Bay in the distance.

"The Doorway of St. Patrick's Cathedral, New York," by William Gordon Shields, is enriched by natural light and refinement of tone, and shows a keen sense of the correct placing of "spots" in the manner in which he "caught" the pedestrians present at the moment of exposing the plate. Also worthy of note is "Heart of the Woods," "Madonna of the Shadow," and "Washday in Little Italy," in each of which there is agreeable composition and the stamp of artistic personality.

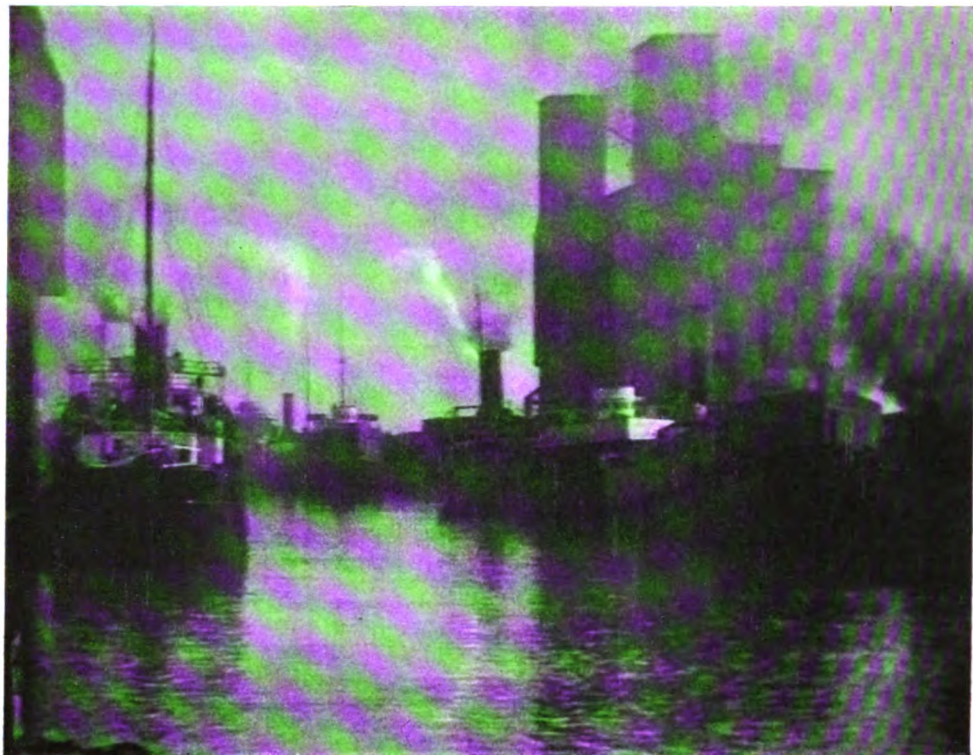
Three large prints by D. R. Shiras, of Pittsburg, show parts of the Panama Exposition, of which No. 236, "Tower and Main Entrance," is best, notwithstanding that the print requires trimming to restore the perpendicular of the columns.

(Continued on page 207)



PITTSBURG SALON, 1917
"THE WAY TO THE VALLEY"
By W. H. PORTERFIELD
BUFFALO, N. Y.





PITTSBURG SALON, 1917
"EARLY MORNING—BUFFALO HARBOR"
BY FRANCIS W. COWELL
LITTLE FALLS, N. Y.





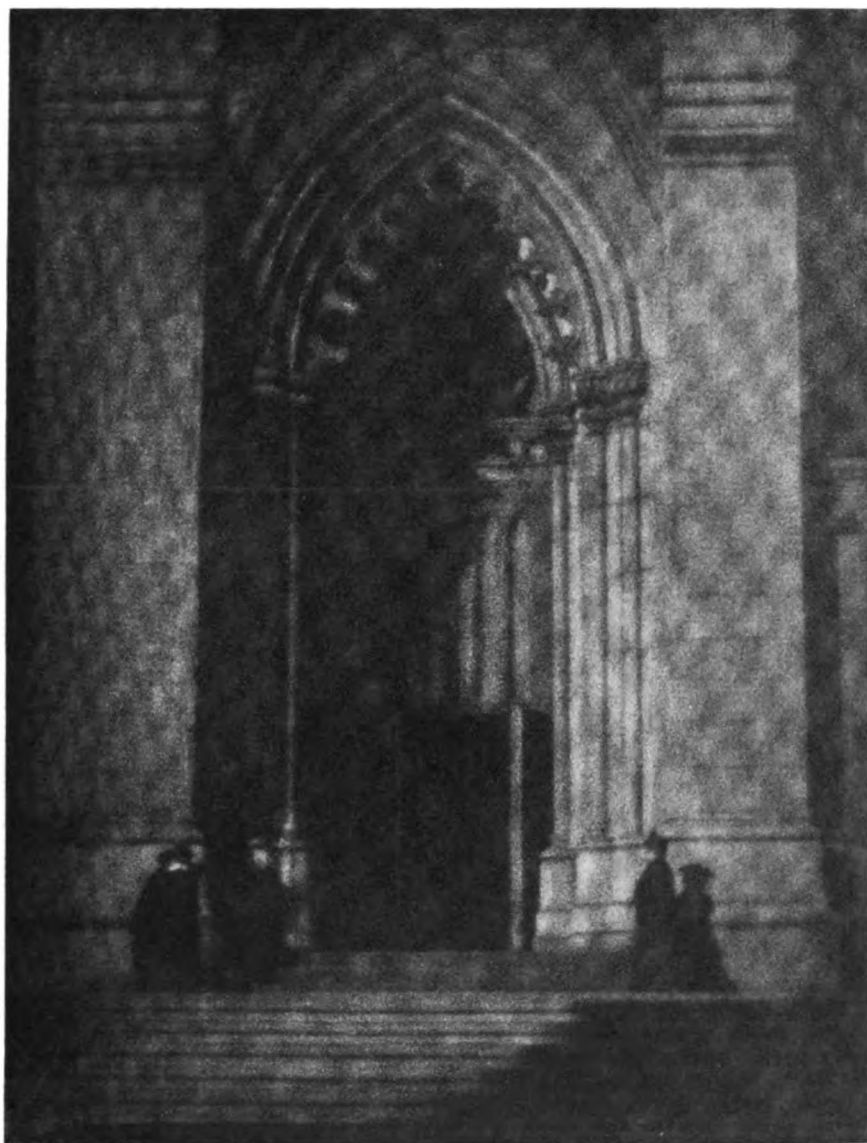
PITTSBURG SALON, 1917
"HISTORICAL BUILDING, BUFFALO"
BY DAVID W. BONNAR
BUFFALO, N. Y.





PITTSBURG SALON, 1917
"CATHEDRAL STREET—THE DIP"
BY H. REMICK NEESON
BALTIMORE, MD.





PITTSBURG SALON, 1917
"DOORWAY OF ST. PATRICK'S CATHEDRAL"
BY WILLIAM GORDON SHIELDS
NEW YORK





PITTSBURG SALON, 1917
"DICKIE'S BREAKFAST"
BY EDWIN G. DUNNING
NEW YORK CITY





PITTSBURG SALON, 1917
"PORTRAIT—M. C. B."
BY MARGARET DE M. BROWN
BROOKLYN, N. Y.





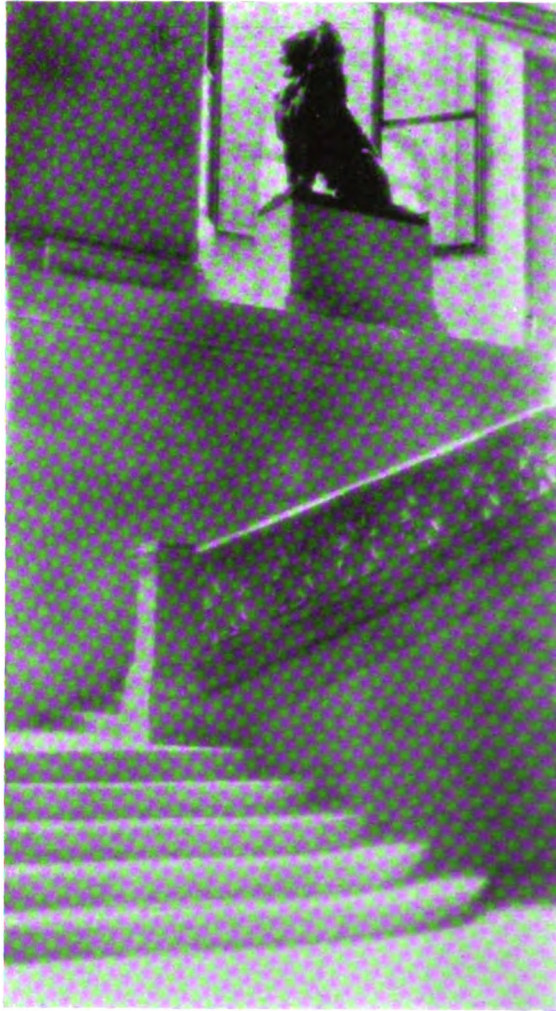
PITTSBURG SALON, 1917
"THE CAVE SPRITE"
BY ARTHUR F. KALES
SAN FRANCISCO, CAL.





PITTSBURG SALON, 1917
"COLONADE"
BY ALICE CHOATE
NEW YORK CITY





PITTSBURG SALON, 1917
"HIS MAJESTY"
BY C. E. BEESON
PITTSBURG, PA.





PITTSBURG SALON, 1917
"FIGURE STUDY"
BY JOHN WALLACE GILLIES
NEW YORK CITY





PITTSBURG SALON, 1917
"THE THIRD FLOOR WINDOW"
BY MARY W. WILTSE
PHILADELPHIA, PA.





PITTSBURG SALON, 1917
"CONCARNEAU, BRITTANY" (BROMOIL)
BY A. D. CHAFFEE
NEW YORK CITY





PITTSBURG SALON, 1917
"LANDSCAPE"
BY W. H. RABE
OAKLAND, CAL.





PITTSBURG SALON, 1917
"THE BUBBLE"
BY ARTHUR F. KALES
SAN FRANCISCO, CAL.





PITTSBURG SALON, 1917
" EDWARD HUTCHINSON "
BY EDWARD HENRY WESTON
TROPICO, CAL.



"The Swan," No. 239, by Albert F. Snyder, of Utica, N. Y., at first inspection seems a trifle overprinted; but when it is remembered that there is ample precedent for his color, as well as the arrangement of the tree branch, to be found in the work of the Japanese, the objection vanishes and we are left to enjoy the beauty of the composition. "The Love Temple," a bit of Grecian architecture, is seen in the shadowy light of evening, in which all detail has been subordinated to the main object. "Brother and Sister," portrait heads, occupy more space in the print than is usually allotted to children, though otherwise good, as is "Knitting," which shows a young woman busy with yarn and needles at a window. Compared with last year's work, Mr. Snyder's present exhibition shows decided improvement in every respect.

Albert B. Stephens, of San Francisco, continues to work out a very interesting design with "Shadows on the Knoll."

"Niagara," "Claremont Inn," and "The Woodland Dance," by Karl Struss, represent widely different subjects executed in his usual style. "Niagara" is majestic; "Claremont Inn" is difficult, and "The Woodland Dance" poetic.

Everitt Kilburn Taylor, of New York, contributes again from his storehouse of European material and sends "Santa Maria della Salute." Light and airy as the scene is naturally, Taylor presents in his print much of the spirit commonly associated with things Venetian.

Edward Henry Weston's reputation as an artist-photographer is not dependent on his success at the present Salon, where he made his first appearance this year. Magazine publishers long ago recognized the value of the work that came from his studio at Tropic, Cal., and gave him space accordingly. His group of prints at the Salon are characteristic, and, whether it be landscape, portraiture, or figure compositions, there is ever present the unmistakable quality that, once known, requires no appended signature to establish identification. No. 258, "Eugene Hutchinson," and No. 262, "Light Play," are typically Weston and must be seen to be appreciated.

"A Pose," by Leonard Westphalen, of

Chicago, lacks the halftones which make "Far from the Madding Crowd" the better print.

William H. Thompson, of Hartford, Conn., discovers in the columns of "St. Paul's—Boston" the material for a poetical architectural study. Likewise, though in different color, "The Capitol—Hartford" is seen in the distance through tree branches that lend a distinct decorative element to the composition. "The Stone Bridge," with a cluster of foreign-looking houses at either end, is presented in a manner that would do credit to an etcher.

"Glimmering Shores," from Ernest Williams, of Los Angeles, is a landscape in delicate gray, where high horizon and well-arranged foreground effect a pleasing composition.

The five prints by Mary A. Wiltse, of Philadelphia, demonstrate the pictorial possibilities that exist in our home surroundings. The prints are modest in size, refined in presentation, and excellent in choice of subject.

"The Third-floor Window" is a combination of figure study at a window and a landscape seen through the window, the remarkable feature of the picture being the successful combining of these elements while preserving their pictorial value. As a child portrait, "Salina" is pleasing and natural, while "A Quiet Moment" and "Morning Sunlight" have individual charms quite in keeping with the other pictures in this collection.

Sanborn Young, of Los Gatos, Cal., is convincing in "Another Bit of Bleeker Street," with its crowds of people and lines of push-carts, evidently a companion piece to his last year's success. "Burned-out in Augusta" is good as a character study, but a better piece of work is a print in pearl gray, entitled "Miss H."

Paul Wierum's two waterscapes, "Sunset Haven" and "At Anchor," are evening scenes across the water, where small boats ride quietly and the setting sun throws a soft light over all, the quality of which is admirably depicted in the prints.

"The City's Portals," by N. S. Wooldridge, of Pittsburg, is effective in the interesting spaces and variety of curves

formed by the arches of the portals. "The Cedar Waxwing," a natural history subject, is pictorial also.

W. H. Zerbe, of Richmond Hill, N. Y., sends two excellent prints, "The Hill Top," where two boys stand looking out

over a town which lies in the valley, and "A Character Portrait" of an old man, strong in expression but slightly too granular to represent good flesh texture.

W. H. Porterfield exhibits six prints.

THE REMOVAL OF HYPO BY WASHING WITH WATER¹

By A. VINCENT ELSDEN, B.Sc., F.I.C.

FROM the instructions usually given as to the washing of photographic negatives it would appear that there is a good deal of misconception both as to the quantity of "hypo" removed with the plate from the fixing bath and the ease with which it can be washed out.

It is not necessary here to go fully into the theory of the operation, details of which may be found in Ostwald's *Foundations of Analytical Chemistry*, 2d English edition, p. 15 *et seq.* It will suffice here to state that, in the absence of absorption phenomena, the quantity of "hypo" remaining in plate after successive washings with the same volume of water may be expressed by the equation:

$$x_n = \left(\frac{a}{m+a} \right)^n x,$$

where x_0 = quantity of "hypo" originally present, x_n = quantity of "hypo" remaining after n washings, n = number of washings, a = volume of liquid remaining on the plate after each washing, and m = volume of water used for each washing.

In view of the fact that a photographic plate has only a thin film of gelatin on one side, it seemed unlikely that absorption would take place to any very great extent, and hence it was probable that the equation would apply in such a case.

¹ A communication to the Royal Photographic Society of Great Britain.

It will be seen from a consideration of the above equation that the quantity of "hypo" left in a plate will be the smaller

the smaller the fraction $\frac{a}{m+a}$. This frac-

tion will be the smaller the more perfectly the plate is allowed to drain between each washing, for by this means a is diminished, and by making m , the volume of water used for each washing, large as compared with a . The equation also assumes that the period of each washing shall be sufficiently long for a state of equilibrium to be reached between the "hypo" in the plate and the "hypo" in the washing liquid—that is, that the concentration of the "hypo" in the film shall be the same as the concentration of the "hypo" in the washing liquid.

If one calculates from this equation the quantity of "hypo" left in a plate after a few washings with a definite volume of water, it will be found that this is so small as to be negligible after a surprisingly small number of washings.

The object of the experiments about to be described was to determine how closely practice would agree with theory, and it will be seen that, within the limits of experimental error, the washing of plates agrees very well with the above equation, and that plates may be very quickly, and with a very small volume of water, washed so far free from "hypo" that the quantity remaining cannot be detected by ordinary chemical means.

Method of Experiment

An unexposed plate was placed in a fixing bath and thoroughly fixed. The strength of the fixing bath was approximately that obtained by dissolving 4 ounces of "hypo" in 1 pint of water. The plate was then removed from the bath and immersed for one minute, with gentle rocking of the dish, in a second fixing bath of the same strength. It was then removed, allowed to drain for a definite time, and placed in a clean dry dish. A measured volume of water was then poured on to it and the plate rocked in the dish for a definite time. The plate was then lifted, allowed to drain for a definite time into the dish, and then placed in another clean dry dish. Each successive washing was carried out in the same manner precisely, the volume of the water used, the period of each washing and of each draining being the same throughout each experiment. In each case the final washing was for a period of twenty minutes, with frequent rockings of the dish.

Each portion of washing water was transferred from the dish to a separate beaker, the dish being well rinsed out in each case, and the quantity of "hypo" in each was estimated in the usual manner by titration with a solution of iodine of known concentration, using starch solution as an indicator.

Some preliminary experiments were made in order to determine the volume of water for each washing and the periods of washing and draining which it would be convenient to use.

The details of some of the experiments are now given in tabular form. In each case the size of the plate used was $3\frac{1}{2}$ by $2\frac{1}{2}$ inches. The volume of water used for each washing was 1 fluid ounce, and the period of draining after removal from the fixing bath and between each washing was thirty seconds. A column is added showing the theoretical quantity of "hypo" which should have been removed by each washing on the assumption that the equation given above holds true.

Experiment A.—Volume of solution removed by plate from fixing bath was 0.71 c.c., containing 0.0806 gram of hypo.

1. *Weight of Hypo Removed by Each Washing, in Grams*

No. of washing.	Period of washing.	Weight of hypo found.	Weight of hypo calculated.
1	1 minute	0.0732	0.0786
2	1 "	0.0068	0.0020
3	1 "	0.0006	0.00005
4	20 minutes	nil	

2. *Weight of Hypo Remaining in Plate After Each Washing*

After washing No.	Weight of hypo. Found.	Calculated.	Hypo found per square inch. Grams.	Grains.
1	0.0074	0.0020	0.00084	0.013
2	0.0006	0.00005	0.00007	0.001
3	nil	0.000001	nil	nil

Experiment B. Volume of solution removed by plate from fixing bath was 0.86 c.c. containing 0.0974 gram of hypo.

1. *Weight of Hypo Removed by Each Washing, in Grams*

No. of washing.	Period of washing.	Weight of hypo found.	Weight of hypo calculated.
1	2 minutes	0.0937	0.0945
2	2 "	0.0035	0.0028
3	2 "	0.0002	0.00008
4	20 "	nil	

2. *Weight of Hypo Remaining in Plate After Each Washing*

After washing No.	Weight of hypo. Found.	Calculated.	Hypo found per square inch. Grams.	Grains.
1	0.0037	0.0029	0.00042	0.006
2	0.0002	0.00008	0.00002	0.0003
3	nil	0.000002		

Experiment C. Volume of solution removed by plate from fixing bath was 0.99 c.c., containing 0.1113 gram of hypo.

1. *Weight of Hypo Removed by Each Washing, in Grams*

No. of washing.	Period of washing.	Weight of hypo found.	Weight of hypo calculated.
1	3 minutes	0.1072	0.1076
2	3 "	0.0039	0.0036
3	3 "	0.0002	0.0001
4	20 "	nil	

2. *Weight of Hypo Remaining in Plate After Each Washing*

After washing No.	Weight of hypo. Found.	Calculated.	Hypo found per square inch. Grams.	Grains.
1	0.0041	0.0037	0.00047	0.007
2	0.0002	0.00012	0.00002	0.0003
3	nil	0.000004		

Experiment D. Volume of solution removed by plate from fixing bath was 0.92 c.c., containing 0.1043 gram of hypo.

1. *Weight of Hypo Removed by Each Washing, in Grams*

No. of washing.	Period of washing.	Weight of hypo found.	Weight of hypo calculated.
1	5 minutes	0.1010	0.1010
2	5 "	0.0031	0.0032
3	5 "	0.0002	0.0001
4	20 "	nil	

2. *Weight of Hypo Remaining in Plate After Each Washing*

After washing No.	Weight of hypo. Found.	Weight of hypo. Calculated.	Hypo found per square inch. Grams.	Hypo found per square inch. Grains.
1	0.0033	0.0033	0.00038	0.0058
2	0.0002	0.0001	0.00002	0.0003
3	nil	0.000003		

Discussion of Results

It will be seen that in no case, except Experiment A, does the amount of hypo removed by each washing, as found by experiment, differ from that calculated from theoretical considerations by any very large amount. There is, however, a steady improvement in the agreement between the found and calculated quantities as the period of each washing increases. This will be clearly seen from the following table, which shows the percentage of the quantity theoretically possible which was removed by a first washing for different periods of time:

Period of washing	1	2	3	5 min.
Percentage of theoretical removed	93.1	99.1	99.6	100 p. c.

This table shows that a certain period of time is necessary to enable equilibrium to become established between the hypo in the plate and the hypo in the washing fluid. It will be seen that equilibrium is nearly reached in two minutes, but is not quite complete until five minutes' rocking in the dish has been given. There is, however, very little advantage to be obtained in practice by prolonging the time of each washing beyond two minutes.

All the experiments show that after the third washing the quantity of hypo remaining in the plate is too small to be detected by ordinary chemical means, and the calculated results confirm this.

It will be seen that the weight of hypo carried by the plate from the fixing solution is slightly different in each experiment. This was to be expected, and was due to the different plates not draining to the same degree, although the time of draining was the same in each case. The reason for this is that the back of the plate is slightly greasy, and hence the liquid does not drain uniformly from it, but tends after a certain quantity has run off to remain adhering to the plate in drops. Thus no two plates will drain to precisely the same extent in the same period of time.

This does not, of course, vitiate the experiments in any degree, and it will be seen that the volume of fixing solution remaining on a $3\frac{1}{2} \times 2\frac{1}{2}$ plate after 30 seconds' drainage will not as a rule exceed 1 c.c.

The temperature of the solutions and the water used for washing during these experiments was about 60° F. It is probable that the time necessary for the attainment of equilibrium between the hypo in the bath and that in the washing water will be to some extent affected by temperature, in the direction that the higher the temperature the shorter this period will be.

Conclusions

From the results of these experiments the following conclusions can be drawn:

1. The rate of removal of hypo from thin gelatin films by washing with water is very closely in accordance with that arrived at on purely theoretical grounds.

2. Absorption effects, in the case of a thin gelatin film, are very small.

3. Plates can be washed for all practical purposes free from hypo by four successive washings of two minutes with comparatively small volumes of water, with intervening draining.

It is proposed to extend these experiments to the case of papers.

THE FLASH-LIGHT IN PORTRAITURE

THE greater appreciation and increasing use of flash-powder shows that the photographer is quick to realize the possibilities of the use of what we may call home-made sunlight. A flash-light is practically an instantaneous burst of bright sunshine. It has one great advantage over sunlight in that it can be produced in places where sunlight never penetrates: We can make our sunlight wherever and whenever we wish.

It is to be expected that the sudden production of a flash of light as brilliant as sunshine, in comparative darkness, must have a very considerable effect upon the eye—an organ which is as sensitive as it is wonderful. While the eye can accommodate itself readily to differences in illumination as much as a million to one, which is equivalent to bright sunlight out-of-doors and a dark night out-of-doors, the changes are usually made more or less gradually. When a change in illumination of anything like this range is made suddenly, some unusual effects must be produced upon the eye.

To find what these effects are, some very interesting experimental work has been carried out at the Research Laboratory of the Eastman Kodak Company. It is well known that the eye seeks to protect itself against sudden changes of brightness. One way is by the involuntary contraction of the pupil of the eye, and a further protection is the closing of the eyelid by a wink. These are known as reflex actions and we have no control over them. A study of this reflex action of the eye must be of considerable interest to the portrait photographer who does any flash-light work.

It has been found by careful experiments that the reflex action of the eye can be photographed and actual measurements made of these movements. This is done by the aid of a motion-picture camera, which can be speeded up so that pictures can be made at the rate of thirty-two per second.

Focussing the eyes in daylight, the motion-picture camera is started and a flash set off fairly close to the subject. The results are shown in Fig. 1. The

pictures were made at the rate of thirty-two per second, the actual exposures, however, being only $\frac{1}{84}$ th of a second each, as the shutter (180 degrees) opening is closed for $\frac{1}{84}$ th of a second while a new portion of the film moves into place for the next exposure. In the first three pictures we see the eye in its normal state. The flash was then fired, and its closeness to the subject is shown by the over-exposure of the fourth and fifth pictures, which get the full benefit of the flash, which lasted for the time of two exposures and two intervals and was therefore equal to $\frac{1}{16}$ th of a second. By this method there is, of course, a possibility of the introduction of a slight error, in case the flash commences while the shutter is closed, though this error may be reduced to a minimum by making the shutter-blade opening as large as possible, thus reducing the pull-down interval.

As before stated a sudden change in illumination produces some unusual effects on the eyes, and in Fig. 1 we have the pictures of what actually happens. The reflex action, by means of which the eye seeks to protect itself, is shown in the sixth, seventh, eighth, and ninth pictures, where we see the eyes gradually close and open in a wink. In the tenth picture they are practically normal again, though it will be one or two minutes before they are absolutely normal as in the first three pictures.

It will be noticed that the reflex action or wink did not begin until the third exposure after the flash had been fired, so that the subject faced the light for a little more than two exposures and the time intervals between, a total of about $\frac{1}{12}$ th of a second after the flash was fired. The wink lasted for $\frac{1}{4}$ th of a second, or a period of time during which the camera recorded four exposures. The time for this reflex action to occur varies slightly with different people, but in no case was it found to be less than $\frac{1}{12}$ th of a second. There is a possibility that the natural wink of the eye may occur simultaneously with the flash, but it would be impossible to foresee or prevent it. Such a coincidence would be extremely rare.

Since the wink or reflex action does not occur until $\frac{1}{12}$ th of a second after the flash has commenced, a flash powder that has an effective speed not slower than $\frac{1}{12}$ th is sufficiently rapid for portraiture.

An objectionable effect seen in some flash-light work, but not actually produced by the flash itself, is what is known as the flash-light stare, so well reproduced in Fig. 2. This is produced by another of nature's efforts to adapt herself to different conditions. Just as when the eye is subjected to a sudden increase in brightness it will close the iris and the eyelid to keep out the light, it will work the other way when the illumination is reduced below normal. In the effort to see better at a lower level of illumination the iris becomes dilated and the eyelids and eyebrows raised.

Fig. 3 was made almost immediately after Fig. 2, the eyes being brought back to normal by pointing the light from an electric lamp at the face, and producing an illumination approximating weak daylight, which had the effect of contracting the dilated pupils and drawing down the eyelids to their normal position, usually seen in ordinary daylight. A good light must be maintained until the moment of the flash-light exposure, the eye must not be focussed into any dark shadow, and care must be taken that the shutter is not opened for any appreciable time before or after the flash, in order to avoid a double image, made possible by the auxiliary light, should there be any movement of the sitter or camera. Such a double image may be entirely prevented by the use of an arrangement which opens the camera shutter and sets off a flash at the same time.

Another very interesting piece of work which has been carried out at the laboratory is that of measuring the speeds of different flash-light compounds. There are several methods of doing this. One of them is to touch off a charge of powder behind a sheet of opal glass covering a circular opening in an opaque screen, in front of which a metal disk with a radial slit about one-fifth of an inch wide is revolved at a given speed. The disk is photographed at the moment the flash powder is fired, and when the plate is



FIG. 1



FIG. 2



FIG. 3

developed the angle of the sector formed can be measured and the speed of the flash easily calculated.

The shutter-testing apparatus at the laboratory will make very accurate measurements, but is not so convenient as the motion-picture camera method, which is extremely simple. The camera is set up in a comparatively dark room. It is operated by a motor and made to run at a constant speed, taking thirty-two pictures per second. The powder to be measured is ignited behind an opal glass screen and its intensity and duration recorded as faithfully as the smile of a movie favorite.

Figs. 5 and 6 show the negatives obtained by such exposures—Fig. 5 being the record of a fast-burning powder and Fig. 6 that of a slow-burning powder. If we measure the density—the amount of the silver deposit on each square—and plot it off against time, we get the time-intensity curve shown in Fig. 4, the curve with the short base representing the quick flash and the longer-based curve the slower flash. Each square or picture represents a time interval $\frac{1}{32}$ part of a second, so that the total duration of the

flash may be taken as $\frac{4}{32}$ ds of a second, and $\frac{9}{32}$ ds of a second respectively. In Fig. 6 we have the slow flash showing nine exposures, indicating that the flash lasted $\frac{9}{32}$ ds of a second. From Fig. 5 we see that the flash had a duration of four pictures, or $\frac{4}{32}$ ds of a second. A reference to the curves in Fig. 4 shows that both powders reached their highest intensity almost immediately and during the second exposure. Owing to the limitations of the half-tone reproductions we cannot distinguish the depth of intensity in Fig. 5 and 6, but they are clearly shown in the plotted curves in Fig. 4. The last four or five pictures in Fig. 6 show a rapid and marked falling off in light intensity. The greatest density—highest illumination—is reached in both cases in from $\frac{2}{32}$ ds to $\frac{3}{32}$ ds of a second.

The effective speed of most flash-powders is usually faster than $\frac{1}{12}$ th of a second, though the speed may drop with age, especially if the powder becomes damp. In this connection, the meaning of the word "effective" will be clear on reference to Fig. 6. It is seen that the last three or four images are very weak, compared with the second or third;



FIG. 6

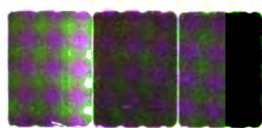


FIG. 5

that is to say, very little impression is made on the film during the later stages

of the flash. In such a case the effective speed may be considered to be about twice the actual speed.

Working with a strong auxiliary light while focussing or combining flashlight with daylight and using a fast flash-powder, both the stare before and the wink after the flash can be eliminated, and results can be produced that are quite as good as those made by daylight alone or any other illumination.

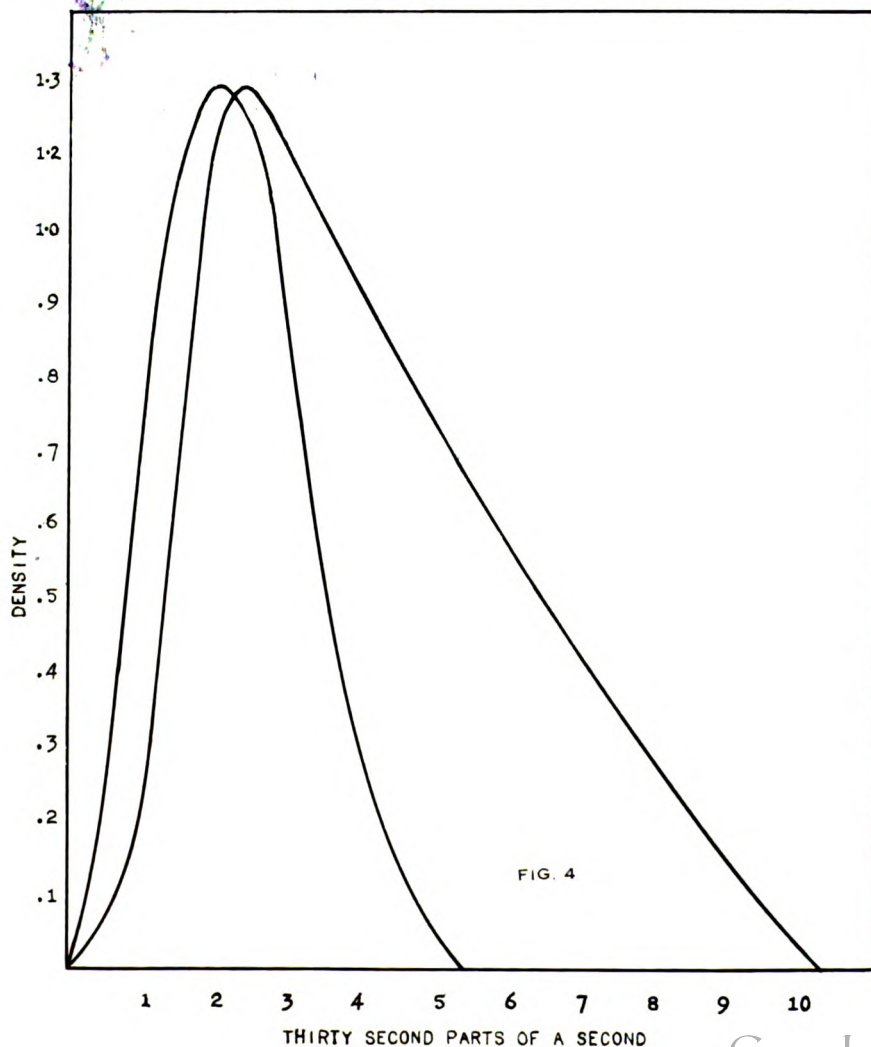


FIG. 4

CARBON PRINTS UPON CELLULOID: BY SINGLE AND DOUBLE TRANSFER

By "CHEMIST"

THE demand for carbon prints upon celluloid has increased considerably during the past two or three years. Although many persons have tried this beautiful process, few have succeeded so far as to produce with certainty a dozen prints without blistering, and many have given up this branch of carbon printing for this reason. It is proposed in this article to give a reliable method of working, so that the prints will be uniform and free from blisters.

In the first place the celluloid should be sufficiently stout to prevent buckling, with a very fine matted surface on one side. The sensitizing of the carbon tissue, too, should be done with a solution of suitable strength, giving ready solubility. The drying of the tissue should be carried on in a perfectly darkened room, and the sensitizing under yellow light. The cutting up of the dried tissue must be done under a deep-colored orange light. These precautions are necessary to obtain pure whites in the high lights and a freedom from color in the safe edging. It is here assumed that the reader has some knowledge of the carbon process, so that the directions given may aid those who have failed in the production of carbon prints upon celluloid.

The sensitizing solution is composed as follows:

Bichromate of potash . . .	4 ounces.
Carbonate of ammonia . . .	80 grains.
Glycerin	30 drops.
Salicylic acid (dissolved in hot water)	30 grains.
Filtered water (or distilled water)	100 ounces.

The salicylic acid may first be dissolved in 4 ounces of water, adding 96 ounces to make up the 100. As soon as the above ingredients are added and completely dissolved, filter the solution into a clean bottle through absorbent cotton. All is now ready to sensitize the carbon tissue.

Pour this solution into a tray about 20 x 24. Immerse a sufficient quantity of tissue in the sensitizer, and carefully unroll it beneath the liquid. Just as soon as it lays flat, turn it over face downward and allow it to remain just three minutes. Then remove it, lay face downward upon a clean slab of plate glass, and use the squeegee upon the back until all the superfluous solution has been removed. Wipe the back of the tissue carefully and lightly with a piece of clean rag. Lift it from the glass slab by the top corners, and suspend it by wooden clips in a darkened room to dry. Just as soon as the tissue is thoroughly dry it may be cut up for printing. The sensitizing solution remaining should be poured into a clean bottle, corked up, and kept in the dark-room for future use.

Carbon tissue sensitized as above will keep well for two weeks if stored under pressure. Assuming that the tissue has been exposed beneath a negative and is ready for development, the following substratum must be at hand, having been previously prepared. It is composed as follows:

Gelatin (Heinrich's hard) . .	2 ounces
Water	12 ounces
Sugar	2 drams

Allow the gelatin to soak for an hour. Meantime prepare in a separate vessel a solution of

Chrome alum	15 grains
Water (hot)	1 ounce

The gelatin, water, and sugar should be put in an earthen vessel, or prepared in a small oatmeal kettle (popularly known as a double boiler), so that the water boils around the pot or inner vessel and causes the liquefying of the gelatin. As soon as the gelatin is well melted and very hot, the hot chrome alum solution may be added drop by drop, stirring the gelatin solution vigorously at the same time. Keep up the stirring for a

short time after the last of the chrome alum solution has been added. Then filter a small quantity of this into a cup or small pot, and as soon as it has cooled down slightly it will be ready for use.

Have at hand a mixture of acetic acid, one ounce; water, six ounces. Take the pieces of celluloid, cut to a size somewhat larger than the tissue to be transferred, and rub the matt surface well with a piece of cotton flannel, dipped into the acetic acid mixture, until the surface is quite clean. Rinse under the faucet, and lay in a tray of clean water for use. For single transfer, take a piece of the celluloid in the left hand by one of the top corners, and pour on some of the gelatin substratum while warm, having the exposed tissue soaked in clean water. Lay it upon the gelatinized celluloid, which must be in position on the squeegee board. Directly upon the top of the tissue place a piece of India-rubber cloth, smooth side uppermost. Then apply the squeegee gently at first, increasing the pressure until all the excess of substratum has been squeezed out. Lift the cloth carefully, wipe off all the remaining substratum with a wet sponge, and put the print aside until the remaining pieces of exposed tissue have been treated in a similar manner. In a quarter of an hour development may be proceeded with.

This is best commenced by laying the prints in cold water to allow them to soak for about one minute. Then place them in warm water, and allow to soak until the tissue begins to loosen. Now lift the tissue by one corner, throw it aside in the waste basket, and proceed with the development by throwing warm water over the surface of the print with the right hand, holding the print by one corner with the left hand.

In the course of a short time the print will be seen to be fully developed. It must now be carefully rinsed in a stream of gently running water, and placed in a tray containing a solution of common alum (not chrome alum), three ounces of alum to one hundred of water. Allow the print to remain in this for five minutes only. Then, after soaking in another tray of clean water for five minutes, the print may be washed in a gentle stream of water and hung up to dry.

It will be observed that there is no sign of blistering or lifting of the film, and assuming that the exposure has been correct, there will be no difficulty in producing one dozen or one hundred celluloid prints in any color, everyone in perfect condition.

To produce carbon prints upon celluloid by double transfer, the process must be modified. Clean the celluloid as previously described, rinse under a faucet, drain, and while still wet pour over the matted surface the same substratum, draining the remainder back into the containing vessel. A large piece of celluloid may be cleaned and coated in the same way, four 5 x 7 pieces being cut therefrom when dry. As soon as the pieces of celluloid are coated they must be laid aside to dry in a clean rack.

When it is desired to make a double transfer the following directions must be carried out. The carbon print is developed upon a flexible support as in paper transfer, and dried. This being done, take a piece of the celluloid with its dried coating of substratum, cut it to a size a little larger than the print, and place it to soak in the 3 per cent. alum solution described above.

Meantime place the flexible support containing the print into clean water to soak for about fifteen minutes. The celluloid may be removed from the alum bath and washed under the faucet. It must now be coated once more with the hot substratum, laid upon the squeegee board, and the wet print on the flexible support laid upon it. Cover this with rubber cloth as above mentioned, and apply the squeegee carefully and lightly, gradually increasing the pressure.

After about eight or ten strokes of the squeegee remove the cloth, and wipe the back of the support carefully until it is free from gelatinous solution. Then very carefully lift the celluloid and support together, starting this lifting by inserting the tip of the blade of a knife at one of the corners. Now suspend the celluloid, with the attached flexible support, to dry. When dry the support will come away freely from the celluloid. All that is necessary now is to place the celluloid, which will now have the print firmly attached to it, into a tray of warm water

for half a minute, then pass it through a tray of clean water and suspend to dry. As soon as the drying is complete it will be seen that the print is perfect in every particular.

The print may now be trimmed, ready for delivery.

The substratum will keep in good working condition for about one week by the addition of a few drops of 10 per cent. carbolic acid solution. It may be kept in the inner vessel of the oatmeal kettle and melted at any time when required for use.

THE CARBON PROCESS FOR THE FINISHING ARTIST

By ARTHUR L. CHERRY

OF all the many branches in professional work none offers so much freedom of expression and individuality as that known as "finishing." It is rather to be deplored that the majority of artists have their "base work" made for them by the printer, usually in the bromide or platinotype processes, with their consequent limitations of color. This must inevitably produce a certain amount of sameness in the resulting work. Therefore no artist should permit himself to limit his expression by always working from one base. Certainly the colors obtainable by the two processes mentioned will afford a perfectly satisfactory ground for most ordinary effects; but where the finisher has some special "scheme" in mind the carbon process, with its infinite variety of colors and surfaces, stands preëminent. A few suggestions are here given as to the possibilities of the carbon print as a means of helping the finishing artist to get out of the rut.

Some of the brighter color tissues are particularly attractive for portraits in a high key, such as Italian green and red chalk, printed of course from a negative not too delicate in contrasts. These carbon sketches often require little or no finishing, but when used as a base for more or less elaborate working up, some extremely beautiful effects can be obtained. The finishing may consist of air-brush work combined with the aid of suitable stencils, or powdered crayons of

a color to match the print. When line work is introduced ordinary pencils are obviously useless, and the medium employed should be brush and color.

In working with water colors it must be borne in mind that any bright transparent colors must have a little black mixed with them, otherwise the result will be raw-looking and will not match the print correctly. For full-length or three-quarter figures, where it is desired to introduce a picture background, a good effect is obtained by air-brushing a light tint all over the print, and upon this painting the sketch in water colors. The high-lights should be rubbed in with eraser, and the scraper used for sharper touches. The use of the tint is obvious where white dresses are in evidence, as it affords a ready means of getting relief by rubbing or scraping away those portions which have a tendency to get lost against the background. Another good color tissue, very suitable for this delicate style of portrait, is that known as gray-green, using a white support.

The two-color portrait consists of a black image upon a tinted ground, usually cream, black and white crayons being used for the finishing. Occasionally the flesh color is suggested with a little red upon the cheeks and lips, but the suitability of this is questionable. Beyond this brief explanation there is no need for any further description as to "how it is done." This is a matter for the artist. Of course, in unskilful hands the

results can easily be bad, as it is obviously more difficult to finish a portrait in two colors than in monochrome. But with a tasteful selection of the two colors for the portrait and background, what possibilities the artist has for producing something far removed from the usual thing! Considering the range of tissues and supports at his command, there is no limit to the variety of effects he can create. This class of portrait has been exploited with much success, chiefly in large heads, but even for quite small work, with three-quarter or full-length figures, some very novel pictures can be produced. The supports generally used are Michellét, or crayon papers. These, of course, can be obtained ready coated and in any color.

Portraits made to resemble sepia etchings require more than ordinary skill in the finishing, and should certainly command more than ordinary prices. The whole of the picture, with the exception of the flesh portions, is expressed in pen-and-ink. This is an extremely difficult medium to use in conjunction with a photograph, by reason of the fact that one is a picture expressed by line and the other by tone, and unless the artist is accomplished in pen-and-ink drawing he would be well advised to practise persistently before attempting to finish a portrait in this way.

The whole of the photograph is very lightly printed (the face excepted)—so light, in fact, as to be only just visible—the object being merely to ensure correctness of drawing. Over this the proper scale of tones is rendered entirely by line work. A guide print of proper depth must be referred to for securing the exact relationship of the varying tones. The "style" of line used requires to be of the fine order rather than bold and open. Any good etching will show at once the "technic" necessary. In sketching draperies it is best to eliminate a number of the small accidental folds and creases usually in evidence. If the larger main lines and folds are secured first it will be a simple matter to add a few of the secondary ones as may be considered desirable. In addition to the drapery and background being rendered in line, a few discreet touches on the hair

will help to destroy the feeling of tone. The color of the tissue used is of some importance to secure the resemblance to an etching, and that known as standard brown will be found quite suitable, using as a support a cream paper with not too rough a surface. The ink used should match the print exactly, and usually it will be found necessary to mix a little water color with the ink. To complete the picture, dry-mount on to a large sheet of drawing paper, allowing a generous margin, plate-sink the mount, and attach the signature in pencil, not in ink. A further improvement is the addition of a neat little margin sketch in the bottom left-hand corner within the plate-mark, the sketch having some connection with the picture itself. This should be in ink, and rather light in treatment.

The practice of oil tinting by rubbing on the dry colors is quite well known, but by using a carbon print as a base some very striking effects can be secured, almost unobtainable in water colors. For architectural, landscape, and genre subjects this method is particularly useful. To those not having practised it the following suggestions may be helpful: For an interior architectural subject use engraving black tissue on a cream support, and coat the whole of the picture with Vandyke brown oil color. Do not put enough to obscure the whole of the tones, but a mere tint of warm color. The simplest way to work is to put too much on at first and then to rub down to the tint desired, as this is much easier than attempting to build up the color. Next rub in the high-lights where required with a hard eraser, but this is better accomplished after the original coating of color has had an hour or so to dry. The putting in of the high-lights and half-tones must be executed with considerable restraint. The whole aim is to concentrate the lights and shadows into simple masses, and thus to destroy, to a certain extent, the wearying amount of detail and the sort of *f/64* feeling so characteristic in subjects of this kind.

This manner of working results in a very pleasing rendering of stone. Warmer colors may be used, if it is thought desirable, but those suggested will probably be found the best. The method is so



VORTOGRAPHY: BY ALVIN LANGDON COBURN

Mr. Alvin Langdon Coburn, whose photographic work has long been so well known, has applied the principles of Vorticism to the camera, and invented a new art, called Vortography. An exhibition of his vortographs, together with some paintings by him, was recently on view at the Camera Club, London. Replying to a criticism, he writes: "I affirm that any sort of photograph is superior to any sort of painting aiming at the same result. . . . Where else but in photography will you find such luminosity and such a sense of subtle gradations? I took up painting as one takes up any other primitive pursuit, because in these days of progress it is amusing to revert to the cumbersome methods of bygone days, that one may return to modernity with a fuller appreciation of its vast possibilities. . . . People have been painting now for several years; it is no longer a novelty; but this will go down to posterity as the first exhibition of Vortography."

much under the worker's control that any attempts to carry it to unreasonable limits must be guarded against in order to avoid anything like freakish effects. For autumn rendering in a landscape a green tissue should be tried for the print itself, the effect of autumn being obtained by the use of a suitable warm oil color sparingly used. The writer has seen some very beautiful marine studies similarly treated. The pictures were printed in Italian green. The sea portion was given a slight tint of lampblack in order to lower the rather vivid color of the tissue, and at the same time being a means of increasing the value of the wave crests, which were rubbed down to white; while the rocks were treated with the merest suggestion of a warm-brown color. This description would imply that the coloring may be carried to any extent; but, as has been pointed out, there is a danger of overdoing it, thus producing a meretricious result. The best effects are

obtained by the use of two colors only—the color of the tissue and the transparent oil paint. For moonlight scenes a suitable color is obtained from a mixture of Prussian blue and lampblack, and employed over a black image. The Prussian blue alone is too raw, hence the necessity for adding lampblack. It is not essential to mix them on the palette, but to apply a little of each color to the picture and rub them well together. The rough transfer papers will be found most amenable to the oil paints. Finally, after due time has elapsed for the color to dry, the picture may be varnished with any good picture varnish, an improvement for any kind of oil-finished picture, but particularly for those subjects in a low key. Needless to say, it is only by persistent effort, ignoring failures, and improving upon successes that the ideal result will be attained.—*British Journal of Photography*.



PRACTICAL PAPERS ON STUDIO WORK AND METHODS

Good Medicine

SOME fifteen years ago there were two physicians who were starting their career, and after watching the results of the work of other physicians and surgeons, and after making some mistakes themselves, they came to the conclusion that there was not as much time devoted to diagnosis as there was to the operation or treatment, and that the reason there were so many failures and slow cures was because only about one-quarter of the time was put into the diagnosis as was put into the operation. Working on that theory, they decided to revise the proportion, and they began putting their few patients through a most vigorous and thorough examination before they prescribed to use the knife. They divided the work, and one would diagnosticate a case first and then the brother would make his diagnosis, then both together would compare notes, and, if necessary, make a third diagnosis together. The results soon began to justify this theory, for, on account of the unusual care and amount of time devoted to diagnosis, when the time came to operate they found that they knew exactly what they were going to find and how they were going to correct it, and the actual work was done in a shorter time with less strain to themselves and less pain and danger to the patient. Soon their operations and cures began to gain fame throughout the country and their practice grew rapidly. Some said that they were workers of miracles, and they were hailed as the most successful surgeons of the country. They replied that they were no better than thousands of others, but that they conscientiously followed their original plan of an exhaustive diagnosis and that they had become so expert in that field that they practically made no mistakes. Their practice is now so large that they have a corps of competent physicians and specialists to help them, besides a large office force and a big hospital that takes care of their patients. They are the Drs. Mayo, of Rochester, Minn.

They succeeded because they knew all about their business before they acted. They knew

what they were going to do and what they were trying to accomplish before they did any work. They did in a profession that thing that keen business men had pronounced to be the only safe and sane way to conduct business in conformity with modern methods and modern competition. And they succeeded. Now other doctors from all over the country and all over the world are studying their methods and following their lead.

Photography is a profession and skill is the principal article in the transactions. The materials throw it into the commercial field to a certain extent, but the ability of the operator and the fame of his skill lifts it above the realm of the purely commercial. But if a doctor can apply modern business methods successfully, why cannot a photographer? He can if he will only believe it. The photographer should practise diagnosis, and here are some of the things he should know before he puts a plate in the holder: The disposition of the subject, the education and the state of development of the taste for good work, the average amount of returns of extra negatives exposed on all the orders of the past year, the average amount paid for pictures from ladies, from children, from men, the susceptibility of the subjects to flattery, and whether such flattery should be subtle or broad, the influence that could be obtained through each subject—in fact, everything that will have its effect on the quality of work that should be made, and the amount of money that can be obtained.

To arrive at this stage it will mean a study of the business on the basis of averages to know the amount of the average of all the sittings, then of all resittings, also the income from duplicate orders, and enlargements and frames, and any other department that yields a revenue. With the average per dozen constantly in mind, then the effort to keep up to the average, or to exceed the average, is a stimulus that will be found extremely beneficial. With actual information of the yield of extra negatives, and the profit yielded by different numbers, the loss of material is decreased and the number used will

be kept near as possible to the highest yield. The number of people who come into a gallery and the proportion who buy pictures is well worth study. If one out of ten has a sitting, then, if the average attendance of thirty a day can be raised to sixty a day, the number of sittings is doubled. Advertising in some form is necessary to get them there. Effort and skill are necessary to get an order from the proper proportion of all who come in the door.

Statistics show, according to Mr. G. W. Harris, that every inhabitant of this country has his picture made once in about twenty years. That has got to be remedied. If a concerted effort is made to bring photography before the public in such a favorable light that this average can be lowered, it will make a tremendous increase in the volume of available business. Who is going to do it? It is certain that the dry goods merchant isn't. It is certain that nobody is going to do it but the photographer and the dealer or manufacturer directly interested in the photographic business. It is also certain that it will not be accomplished except by constantly bringing photography before the public in attractive forms through advertising, personal contact, and publicity of all kinds. The average must be lowered, and the advertising problem is one that concerns every individual in the business, for what will benefit some will eventually benefit all, and a general wave of energetic progressiveness will increase the average for everyone.

Can it be done? We are decidedly of the opinion that it can. Astute business men in other lines have increased the use of numberless articles that people thought had reached their maximum consumption. The advertising pages of the papers and magazines show how it was accomplished, and the publicity bureaus, maintained by a number of industries, show what can be accomplished by systematically calling attention to any article. The National Association might well establish some such bureau, whose duty it would be to supply the press, both daily and periodical, with interesting literature and illustrations, bringing photography to the attention of the public. But as such a movement is only one of our "pipe dreams," we are not pressing that point now, but are trying to stir up a desire for some systematic way for each individual to study the little things that will help to build up better orders and better profits. The study of details is "good medicine" for any business. The having of this information at one's finger ends is also "good medicine," for its moral effect is pronounced in the rousing of the ambition to make every stroke tell and every job keep up to, or go ahead of, the average. It is the total of the constant strokes that make the big impression, and it is the little excess on each order that brings up the average. It is the pushing of the profitable parts of the business that makes the good showing at the end of the year.—*Trade News*.

The Care of Photographs

WE are afraid that in the majority of cases photographers are lacking in respect for their

productions. We do not mean that they do not esteem the artistic qualities highly enough, but they do not appear to consider a photograph, as such, is worthy of as careful preservation as a drawing or engraving. It is true that when a considerable sum has been expended in "working up," a print is usually honored with a frame, but in the case of an ordinary print which can be replaced at small cost it is submitted to the ordeal of the reception room without the slightest protection. The sight of this cannot fail to react upon the mind of the sitter, who will naturally wonder why pictures for which such a high price is asked are treated in so negligent a manner, and it will also cause a doubt as to whether they are worth the amount demanded for them.

Beyond this there is a probable loss of business in the way of frames, cases, portfolios, or other contrivances for the effective display or safe keeping of the portraits. It is true that a certain proportion of portrait photographs do find their way to the picture framers, but not one-tenth of the framing orders which might be executed by the photographs are ever secured by him. It is moreover essential that good work to be shown to advantage should have an entirely appropriate setting and not be left to the mercy of the assistant at the bargain counter of a department store, who is only anxious to sell that particular failure in frames on which he obtains the largest commission. It would be a good thing if the photographer worked upon the assumption that his work is not finished until it is framed, and to instil that idea into the mind of his customer, who, in most cases, will fall in with it readily, provided that frames costing only a modest amount are submitted in the first place. The mouldings should be simple but of good quality, and the frames should fit the photographer's standard sizes of mount, no cut out or extra mount being permitted. In some cases the best effect will be obtained by mounting "close up," and for this style rather heavy mouldings are to be preferred.

The way in which pictures are now "fitted up" by most framers is far from satisfactory, the piece of brown paper pasted over the back covering a multitude of sins, while in itself it is frequently the greatest sinner of all. It is rarely that we find the glass secured to the rebate of the frame by means of strips of paper to prevent the access of dust and fumes, and rarer still to find a properly jointed back board which can, in like manner, be pasted in so that the picture is in a practically air-tight case. In place of this we find a glass which barely holds in the rebate, and often so curved that it only touches the latter at a few points, a few pieces of rough back board, often running with turpentine, which approximately cover the back of the mounting, and a sheet of brown paper which has been glued over them in a saturated condition, and which starts on its deadly work of fading the picture, or at least staining the mount, the moment it is put on, although it may be months or even years before the dire effects are fully visible. It is an excellent plan, whenever possible, to bind the picture and glass together, in passepartout fashion, using a sheet of stout manilla paper to cover the entire back, and just lap over the edges of the glass, to which it is fastened with a little good glue, or by

means of strips of gummed paper in the same way as the binding of a lantern slide is accomplished. Whenever it is possible an inside slip, which need not be visible, should be provided to keep the surface of the print from touching the glass, so that in case any moisture should condense within the frame it should run harmlessly down without staining the picture. This precaution, it is needless to say, should always be taken when framing colored photographs.

Even worse than the maltreatment of their own work is the careless, we might almost say dishonest, treatment of originals sent to some photographers to copy. On many occasions we have seen old portraits which their producers have carefully sealed up, stripped of their glasses for the purpose of making the negative and put back into their frames or cases with the edges open, to deteriorate more in a few months than they have done in many years. With daguerreotypes the greatest care is necessary, and the same may be said of unvarnished collodion positives and ivory miniatures. If gold-beater's skin is not readily obtainable, although most chemists keep it, the thin paper sold in rolls for mending books and music will answer nearly as well for all but the smallest sizes. Photographers having a good class clientele might do worse than to advertise in their price lists that they are prepared not only to copy miniatures and other old portraits, but to take the necessary steps for their preservation.—*British Journal of Photography*.

The Parting of the Ways

It has been truly said that no man can serve two masters, and it is as great a truth that a photographic business cannot be run to issue two classes of work under the same name with any chance of ultimate success. It is a lamentable fact, however, that the first remedy that suggests itself to a good class photographer who finds business falling off is either a reduction of his prices or the introduction of a cheaper class of work. This may be called the policy of panic; it is that of a nation which cedes a province to the enemy instead of fighting, and is a frank admission that he who does it has been outclassed. The man who has enjoyed a reputation for artistic work cannot come down to the level of the commonplace if respectable suburban photographer, and at the same time hold together his original clientele at his old prices. One or other must go, and a reduction in prices usually means the commencement of a period of decadence which only terminates in extinction. Every business man knows that there are certain fixed charges upon a business, and that for a high-class concern these are much heavier than for one of more modest style. Rent, rates and taxes, renewals of furniture and accessories, salaries and the like have to be divided among the orders executed, and it will probably be found that these alone almost cover the price obtained for the cheaper work. The running expenses on an order for "cartes," or even post-cards, are nearly as heavy as those on one for cabinets or larger. Plates, paper, and mounts form but a small proportion of the cost of a finished photograph, and unless the standard of

work is lowered there is little to be saved on the retouching and finishing.

One point cannot be too strongly emphasized. There is no going back once the decision to reduce price has been made. Nowadays it is within the power of only very few to raise that standard of a photographic business. It must start with a certain quality of work and appeal to a certain section of the public, and by this it must stand or fall. In some commercial circles there is a limited class of "business doctors," little known to the general public, who can be consulted by the manufacturer or storekeeper who feels that a "rot" has set in to which he can assign no definite cause except the general one of bad trade. These individuals, having no prejudices of their own, can review the business in an impartial manner, and are usually able to point out why the takings have fallen off. It is a common failing to put all the blame upon the public and to take none upon oneself, and this little matter is one which the "business doctor" has to adjust. After he has had the run of the place for a week or two we will suppose that he says: "There is a general slackness in every department. Your receptionist is obliging and courteous, but not keen; your operator has got into a groove, and your pictures, although respectable, are lacking in the interest and 'go' shown in those of your rivals. Your reception-room and studio are dingy and old-fashioned, and your specimens are not representative of the best you can do." These are perhaps unpleasant things to be told, but one will not so much mind hearing them from a man whom one has paid to tell one. It is a false idea to assume that all is well because there are no complaints. Customers, as a rule, hate to grumble; they quietly go elsewhere, and one never knows why.

Now for the remedy. In the majority of present-day studios the staff is underpaid and overworked. How many receptionists are paid three guineas a week? We know of two or three. They are in successful establishments, and the ability to pay this is not only due to the prosperity of the business, but the prosperity is due to the efforts of the well-paid saleswoman. As with the receptionist so with the operator and printers. There has been a whittling down of salaries to a point at which it pays much better to be a tram-driver than an operator. We must confess to blushing occasionally when we look down our own situations vacant column. How can a man be expected to put life and vim into his work on one hot dinner a week? In photography more than almost any other business an alert, active mind is needed by every worker, and this can only be maintained by the means to procure the ordinary comforts of life. Have by all means fine premises, good apparatus, and use the best materials, but do not spoil them all with cheap labor, which is bound to be slow even if conscientious; and, furthermore, do not try to improve business by lowering prices. It is idle to talk of bad trade; never were higher prices paid for photographs, never did photographers pay more for the accessories and apparatus.—*British Journal of Photography*.



Camera for Aërial Use by the Army and Navy

THE Eastman Kodak Company has achieved the invention of a camera for use in aëroplane operations and is now prepared to furnish it to the War and Navy Departments. The United States Government has engaged to take the complete output of the Kodak Company as fast as these cameras can be supplied.

The Eastman camera for aëroplanes is said to be superior to any camera for aërial use now employed by any of the European armies. It is adjustable to practically any angle, instead of being operative only when directly over the object to be taken, as is the case with the British and French cameras. It is equipped with various safety devices rendering it adjustable to different conditions of the atmosphere, including rain and fog.

Several local tests have been made recently of the camera and all these have proved satisfactorily. The camera is able to take pictures at a height of nearly 5000 feet. Either film or plates may be used.

Optical Glass Made in America

WE learn that the Bausch and Lomb Optical Company, Rochester, N. Y., are now making optical glass in their own plant in Rochester and the glass is said to be equal, if not superior, to the best glass made in Germany.

You Can Do It

THERE is nothing new under the sun. There is nothing which one man has done that cannot be done by another and improved upon. It may take a little longer time for one person than for another, but perseverance always brings success. All over the country are photographers who are making a success of the business. We do not mean that they are just getting a living, just paying their bills and have a few dollars left over for a vacation. They are running a business which pays a good salary and a profit on their investment, and what others have done, you can do, and you can do it right in the town where you are now located if you will go at it in the right way.

The first thing which you must have in order to do what others have done is a credit that is

unquestioned by any one with whom you are dealing. If you must owe money and owe it for any length of time (in order to get yourself rightly located, rightly started, and in a position to handle your business so that you do not have to use one excuse after another to your customers because their work is not finished), then borrow the money from your bank. They will carry you for 6 per cent. interest, and you can cash your bills and still be ahead 18 per cent. per year, and that 18 per cent. will in most cases more than pay your rent.

Another man's success can be your success. A photographer can become just as popular in your town as in any other. We oftentimes have some one tell us that this or that city is a good photographic town. Why? Because it has been made good by some up-to-date, reliable, enthusiastic, pushing photographer, and the reason it is poor in other towns is because it has never been rightly advertised or pushed.

Too many stand back with a blank look, not knowing what to say when they find that some man has made good simply by plugging all the time, giving all his attention to the business. It may require more work for one man than for another to get the same results, but whenever you see the success which has been accomplished by any one in the photographic business, remember, *that what others have done you can do.*—Ohio Photo News.

Dr. Mees on the Theory of Reproduction.

DR. C. E. KENNETH MEES, of Rochester, gave a most interesting "talk" to the members of the American Institute of Graphic Arts, at the Advertising Club, on Wednesday evening, March 28, on the "The Theory of Reproduction," which he regards as the basic principle of photography.

Dr. Mees, among other things, set forth in a very clear way the principle of gauging the exposure of plates by means of the brightness of the image on the focussing screen. The speaker took occasion to point out the range of light intensities existing in various subjects which are commonly photographed. The method of using a light-source of known power in conjunction with a densitometer for the determination of correct exposure, supplemented Dr. Mees's talk by presenting on

the screen suitable instruments used at the Eastman Laboratory in practice of the system. Dr. Mees also presented briefly the present status of color-film photography, and from his remarks the outlook is not very promising as to scientific results of a satisfactory nature.

Picture Exhibit at the National Convention in Milwaukee

THE picture exhibit at the National Convention this year is planned to serve two purposes: First, to furnish those who send pictures to the exhibit such information and constructive criticism as will enable them to better the general quality of their work. Second, to show those who come to the Convention some of the best work that is made in America today.

The primary consideration, in accomplishing the first aim, is the selection of judges who will be able to analyze the pictures that are submitted and who will be able to put into concise and positive terms the points that they find in the pictures. Although the Board is not ready to announce the names of the judges, the President is in communication with three competent men who, if they can be secured, will comprise one of the most competent juries that ever passed upon the pictures at a National Convention.

The judges above referred to will have charge of the portrait class. Ratings will be given on the four following subjects: Composition, tone values, background treatment, and exhibition effect. Twenty-five points will be allowed for each classification.

Two judges will be appointed to pass upon the pictures in the commercial class. Just as great care will be used in selecting these judges as those who will have charge of the portrait class. They will furnish ratings on the following subjects: Utility, composition, lighting, and technic. Twenty-five points constitutes perfection in each classification.

The judges will divide the pictures in the portrait class into three divisions. Those rating sixty per cent. or more will be placed in Class A, and from this class, not to exceed twenty pictures, will be selected for the National Salon and certificates of merit will be awarded to those whose pictures are selected. Pictures rating between fifty and sixty will be placed in Class B. Those rating below fifty will be placed in Class C. Classes A and B will be catalogued.

This classification is arranged to overcome the objection made at some of the recent conventions, where all of the pictures have been hung together so that it was impossible for those who viewed the exhibit to determine which the judges considered the better pictures.

At the last convention only three pictures rated eighty per cent. or better. The highest rating given was eighty-three. There was a total of 155 pictures that rated sixty per cent. or more and salon honors awarded to pictures rating as low as seventy per cent. Therefore, one can see that the judges have used a very close marking and have established a high standard to be attained only by careful selection on the part of the exhibiting photographers.

It is suggested that only those pictures which

have been made since the last convention be entered in the exhibit this year. This suggestion is made because the Board believes that a ruling of this kind will result in the greatest good to each exhibitor.

Special distinction will be given the pictures in Class A. Screens will be constructed so that the pictures in this class may be shown to the very best advantage.

Prepare your prints now or at least begin to prepare them and when you have them ready send them to the Photographers' Association of America, care of the Auditorium, Milwaukee, Wis., transportation charges prepaid. Do not put this matter off until the last minute and then send in any old thing you have on hand. If you send your exhibit in now, it will be well taken care of until convention time. You may enter three pictures in the portrait class and three in the commercial class. There is no ruling as to size or style and they may be framed or unframed just as you see fit.

All exhibits must be packed and marked carefully. The P. A. of A. will not be responsible for lost exhibits.

Displaying Flexible Mounts

THERE is every reason for believing that the flexible rough paper mounts have "come to stay," and a fitting method of displaying them in the show case or window is therefore a desideratum. In the majority of cases the effect of the display is somewhat spoiled by the buckling of the mounts, which are very susceptible to atmospheric influences, and various devices have been tried in order to secure flatness. The use of drawing pins is only partially successful, as any reasonable number only serve to reduce the size of the bulged portions while adding to their number. Besides, it is not always desirable to fix the prints to a board or panel, and recourse is often made to a covering of glass, which, while helping to keep the mount clean, does little to flatten it. A plan we have lately seen in use, and which has much to recommend it, is to bind the prints between two clear glasses, using the ordinary lantern binding or, if preferred, the transparent binding strips used for repairing music. The glasses must be about an inch larger either way than the mount, so that the deckle edge is clearly shown. The backing being clear does not suggest that the print is framed in any way. A clip similar to those of the old Mora frames could easily be adapted to hold the two glasses without binding, and the changing of specimens would thereby be facilitated.—*British Journal of Photography*.

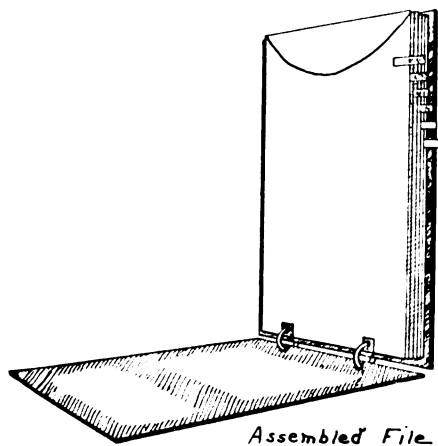
Mr. Eastman's Career

MR. GEORGE EASTMAN has always so carefully avoided the limelight of modern journalism that much less is known of his remarkable career than of that of many other leaders of commerce of far less ability or success, so that the account given in *Leslie's Weekly* comes with a freshness even to those who have watched the growth of the Eastman organization from the start. Mr. Forbes, who writes the article, describes the

commencement of the Eastman plate factory, its early difficulties and how they were surmounted, and then the production of the first kodak. He asked Mr. Eastman what kodak meant, and was told, "It does not mean anything. We wanted a good strong word, one that could not be misspelled or mispronounced, and, most important of all, one that could be registered as a trademark that would withstand all attacks." Some concerns use a fancy word bearing on its qualities or characteristics, which is always a most dangerous course, as it often happens when the mark has been made valuable, it is found that the word was ineligible and so becomes public property: while others make up words which are easily misspelled or mispronounced, or even words which go outside the resources of the English alphabet and need accents and pronunciation marks. "Kodak" avoids all the pitfalls; it is universal, and from a purely manufactured word has taken a permanent place in the language. The whole article is well worth reading.

Film Book for Photographers

OFTENTIMES, in the art and pastime of picture-taking, there are little instances when one would give a good deal to know when and under what conditions a certain picture was taken; or, at other times, he suddenly wants all of the films which he has exposed of a certain nature, such as those of indoor pictures, animal life, and so on. And in many cases it is quite necessary for the photographer to practise some sort of a classification.

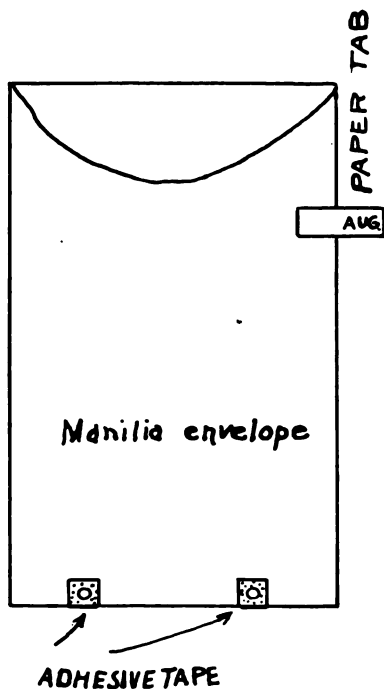


The accompanying sketch shows the construction of a very simple and serviceable film-file which will prove an indispensable addition to the photographer's equipment. The total expense for the outlay is but thirty or forty cents, and the time required to make it will fall short of a couple of hours.

Supposing that the file is to accommodate films from a postcard camera, purchase the cover of a loose-leaf notebook from the bookstore, an inch or so larger each way than the size of the

films. Then buy, also, a number of manila envelopes, slightly larger than the films and that will fit well within the covers of the notebook.

With the holes of one of the covers, if it is not joined at the back, mark the location of the holes to be punched, on each one of the envelopes. Then, referring to Fig. 1, apply short strips of adhesive tape to the edges of the envelopes, so that the holes may be punched through the tape and envelope also. The reason for the tape is obvious: It strengthens the edges of the holes



Showing preparation of each envelope

and prevents them from tearing out. The holes are punched with any leather or paper punch. Care must be taken that the location of the holes is the same on each envelope. They are then assembled in the book as shown.

Two methods may be adopted for the classification: The envelope may either be labeled with the months of the year, thus making it easy to ascertain within a month of the date of the exposure of the film therein, or the labels may read such as—"Indoor Photographs," "Snapshots," "Child Portraits," and so on. Or, if preferable, they may be labeled to suit the taste and needs of the owner.

An ordinary cover will hold enough envelopes to take care of upward of five hundred films easily, and with the simple classification suggested it will be possible at a moment's notice to lay hands on almost any picture taken.

Should a larger file be desired it remains but a

matter of choice, for the bookstores carry a large assortment of sizes of the loose-leaf covers.

Not only will this little arrangement prove very helpful to one for indexing and classifying pictures and films, but it may just as well be used for a scrap-book for clippings or notes.

Our Cover Picture

THE striking and appropriate picture on our cover this month is by Harry C. Phibbs, of New York City. This print was exhibited in the recent Pittsburgh Salon and attracted unusual attention as a figure study.

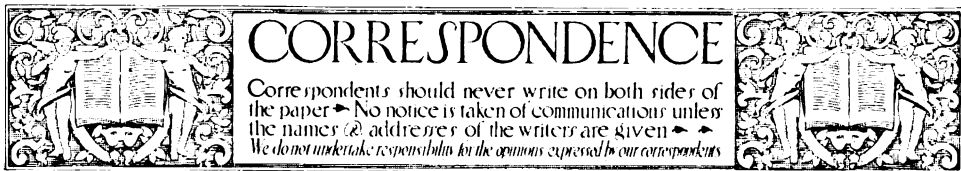
Photograms of the Year

THE 1916 volume of *Photograms*, edited by Mr. F. J. Mortimer, F. R. P. S., establishes itself as a record once again of the pictorial photographic work of the year. It contains reproductions of many of the leading pictures in the exhibition of the Royal and London Salon,

in addition to a number from colonial and foreign workers. These are presented by a high form of printing and do justice to the originals. There is a review by the editor on "The Year's Work," and articles on "Essential Aims in Photographic Art," by Anthony Guest; "The Future of Pictorial Photography," by Alvin Langdon Coburn, and "Pictorial Photography in America," by W. H. Porterfield. While the pictures do not show any advance over previous years, the entire book forms an interesting corollary on the vitality of photography during the greatest war in history. Messrs. Tennant and Ward, 103 Park Avenue, New York City, are the American agents. The price in paper covers is \$1.25, and cloth, \$1.75, postpaid.

A Correction

AN error, the print appearing on page 158 of our April issue, was attributed to Jane Reece, Dayton, Ohio. This picture was made by Nancy Ford Cones, Loveland, Ohio, who should receive full credit.



WORTH-WHILE LETTERS ON LIVE IDEAS FROM OUR CONTRIBUTING EDITORS

Suggestion for Vignetter

TO THE EDITOR:

SIR: Here is an idea for vignettes. Make your vignette card as usual, but, instead of tacking same to printing frame, take four pieces of thin, flat metal (moulding hooks of the plain kind will do nicely), bend them to the shape of square staples, and you have four clips with which to clip your vignetter to your printing frame.

A set of these clips have saved me time and loss of temper many times, being easily adjusted and always ready; no slipping of card as when card is tacked on.

M. S. FRENSELY.

The Question of Costs

TO THE EDITOR:

SIR: In reply to your general inquiry for suggestions, we wish to be placed on record as desiring to cooperate in every possible way.

The first good idea that comes to my mind is one which is reiterated in your JOURNAL, viz., the question of costs. In every little detail of production it would be safe to say that the cost is double that of the prevailing idea. For instance, until we departmentized the retouch-

ing department, in which we had good, faithful, energetic, and efficient workmen, we thought our retouching was costing us in the ordinary way from ten to twenty-five cents a negative. We now give that department credit for retouching at the rates we charge for extra negatives, viz., half cabinet, 50 cents; cabinet, 75 cents; 5 x 8, \$1.00; and 8 x 10, \$1.50, and charge them all expenses, including rents, salaries, heat, etc. The result is only an ordinary gross profit, which is further cut down by a charge against it of selling expenses. And so it goes on all along the line—the printing and the mounting departments—and it seems that there is no limit to the size of the administration and selling expense.

Unfortunately for the trade in general, it costs more to take a poor photograph than a good one; therefore it is difficult to establish and maintain a generally profitable schedule of prices.

It is, of course, unnecessary to legislate for, or consider the highly artistic photographer, as he can take care of himself and his name; but when a man or woman knows the cost, the selling price will soon adjust itself; human nature is built that way. Let us have plenty of information along that line from anyone who may have some concrete information on this subject. General terms are easily expressed but difficult

to define and apply. We all understand dollars and cents, so let us get down to figures—in this way we can be of real help to each other.

Rice Studio Limited,

March 21, 1917.

CHARLES P. RICE,
President.

Electric Printer and Methods

TO THE EDITOR:

SIR: The accompanying illustration shows three views of a printing device which I have used for some time in the studio work, and like it very well. I have shown three views—side, front and top—to illustrate the placing of lights and switch.

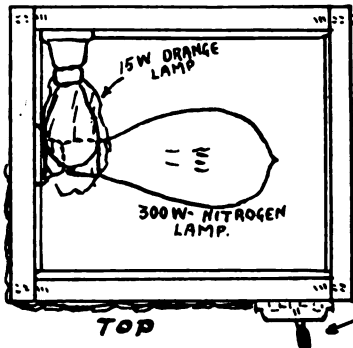
I use a two-way knife-switch to operate the lights, having the wiring so arranged that when one light is on the other one will be off, or by

this printer. With this light the average kodak snapshot negative prints in from one to three seconds. For professional negatives, portrait, etc., I usually use a sheet of glass with one thickness of tissue paper pasted on it, between the negative and the light, to hold back the printing and give greater accuracy. The glass may be placed beneath the printing frame, and a ground-glass might be better.

At the top of the box, around the inside, a small shelving of cleats is nailed to prevent the printing frame from dropping inside. The cleats should extend entirely around the inside to prevent light from shining up past edge of frame when turned on.

We use an 8 x 10 frame for professional work, and a 6½ x 8½ frame for amateur finishing. A frame is nailed around the outside of the smaller printing frame to make it fit the printing box.

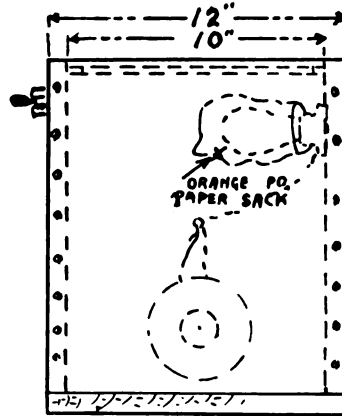
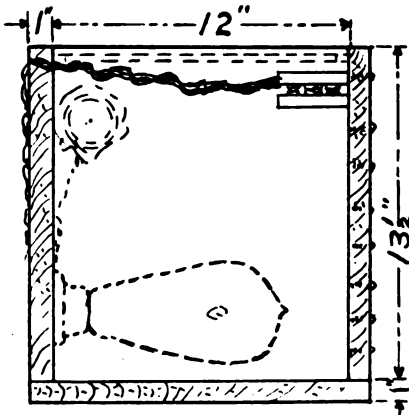
I usually remove the spring fastener of the



HOME MADE PRINTER UP TO 8" x 10"

MATERIAL
5 Pcs 1" x 12" x 13½" PINE
1 15-W LAMP
1 300W " "
1 2 WAY KNIFE SWITCH
1 DROP CORD.
WHITE OIL-CLOTH FOR LINING.

TWO-WAY SWITCH
FOR OPERATING LIGHTS



leaving switch out of both connections both lights will be off. This saves current somewhat in a big day's printing, and is a point not to be lost sight of.

A ten-watt or fifteen-watt light is sufficient for the colored light, and an ordinary bulb with an orange-colored sack placed over it is very good. For the printing light, I find that a light of from one hundred and fifty to three hundred watts gives about the best printing strength. A three-hundred watt nitrogen bulb is used in

longest leaf of the printing frame and screw a screen-door knob in place of it, and then in rapid printing hold lid down with weight of hand rather than by fastening.

In printing from film negatives a good idea is to have a sheet of heavy-weight mounting paper on inside of frame, which will be of help in holding film and paper together until lid is brought down.

I have found that for marking time an ordinary alarm-clock is better than a timer, because

the ear is surer than the eye, and as with any clock one beat always sounds more distinct than the succeeding one, we count each second beat. Keeping count in this way does away with the necessity of looking up from the work at the timer or straining the eyes in a dim light to see it.

In the construction of the printer, if the dimensions are used as given in sketch it will be found that the five pieces of lumber required to construct it are all of the same dimensions. When nailed together the inside of the top becomes 10 x 12 inches, which is about the outside dimensions of the usual 8 x 10 printing frame. The depth of the box from bottom of printing frame is about twelve inches.

It is commonly claimed that the printing light should be as far from the negative as the diagonal of the plate. In printing from an 8 x 10 plate on this printer the light is only about eleven inches from center of plate, but by having box lined with white oil-cloth, and by printing through ground-glass or tissue-paper, no difference can be noted in the printing surface.

In placing the lights, have large lamp as near as possible to bottom of box without burning cloth, and have the light filament about the center of box. The orange light must be placed so that a line drawn from the light to the back side of the plate will just miss it, and thus no shadow of the light will be thrown upon the back end of a large plate in printing.

It is advisable to attach a couple of pieces of wood beside the switch so that fingers cannot touch the metal part in operating, for in working on a ground floor, in damp weather some

electrical connection is formed with the earth, and occasionally a slight shock is given the fingers.

The printer may be kept upon a low stand or table, but preferably should be nailed to the wall. By nailing a couple of boards to the back of printer, so that ends stick above and below, these ends may be nailed to the wall.

In connection with this printer it is a good idea to have a rack with pigeon-holes placed on wall just above printer for holding negatives, paper, etc.

The principal argument for this printer is the speed with which work may be turned out. As to economy: Counting five seconds as being the average printing time, about eight minutes' burning of the strong light is sufficient to print one hundred prints, and as a three-hundred-watt light costs about three cents per hour to burn, it will thus cost much less than one cent to do a day's printing in the small studio.

ROY F. NIXON.

Hypo for Fixing Prints

TO THE EDITOR:

SIR: In reply to your letter of recent date, a practical note for the "Workshop," will say that I have found in making sepias that the addition of spent acid hypo used for fixing prints, added to the usual hypo-alum bath, will quicken and rejuvenate the hypo-alum bath, making sepias of equal tone, putting to use a waste product. Have only used it on Ago.

A. B. STEBBINS.

March 23, 1917.



AMONG THE SOCIETIES



Resolutions by the Federal Photographic Society

WHEREAS, Thomas William Smillie, photographer for the United States National Museum, and custodian of its section of Photography, passed away after a short illness in Washington, D. C., Wednesday, March 7, 1917; and

WHEREAS, Dr. Smillie headed the photographic laboratory of the National Museum from 1871 to the date of his death, during which period he rendered such services to the art he loved as will cause his name to be forever revered by all who have so materially benefited by his labors; and

WHEREAS, The National Government profited by his skill and knowledge not only because of his official position but by reason of his researches for the post-office, his unselfish devotion to, and aid in, the labors of the Fish Commission, his assistance to the late Professor Samuel Pierpont Langley in his experiments with the bolometer, and his highly successful organization of the

photographic work of the Smithsonian Expedition to Wadsboro, North Carolina, to observe the total solar eclipse of 1900; and

WHEREAS, His ability as an organizer, his facility of invention, his assistance to Mr. George Eastman when that pioneer was first revolutionizing the science of photography by the introduction of hand-cameras and roll-films, brought him the affection, admiration, and esteem of all who labor for the perfection of photographic processes; and

WHEREAS, His death is a loss to the Paris Academy of Inventions, of which he was an honorary member, the Royal Photographic Society of England, of which he was a Fellow, the American Association for the Advancement of Science, the Philosophical Society of Washington and American Academy of Political and Social Science, of which organizations he was a member; now therefore be it

Resolved, That the Federal Photographic Society of America, of which Dr. Smillie was first and only Honorary President, does here

record its deep grief at the death of one who honored the profession he so well adorned and its sympathy with his surviving relative, and many friends in the bereavement they have sustained; and be it further

Resolved, That a copy of this resolution be spread upon the minutes of the Federal Photographic Society, that a copy be sent to his sister, Miss Lydia Smillie, and to the Smithsonian Institution, and that copies be furnished the photographic press and the daily press of Washington; and be it finally

Resolved, That we, the Federal Photographic Society of America, sincerely believe the place Dr. Smillie leaves vacant can never adequately be filled, and that because of the gentle character, sterling integrity, eager spirit of helpfulness, deep erudition and kindly courtesy of a man beloved by all who knew him, the world at large, as well as that of photography and of science, is the poorer for his passing.

(Signed) ANTHONY LUDWIG,

L. W. BEESON,

E. L. CRANDALL.

March 16, 1917.

The Pictorial Photographers of America

AT the present time, public interest in good photography has assumed proportions which impel an organized effort for continuance in its development. The Pictorial Photographers of America is an organization of well-known men and women who have pledged themselves to engage in a campaign which will help place photography on a higher plane. Following are the plans of the P. P. A.:

The Pictorial Photographers of America will endeavor to carry the message of good photography to a public anxious to see what photographers are doing. They will encourage good work, and if a city needs an exhibition, this organization will plan to send the yearly collection of the work of advanced photographers and see that the exhibition is properly housed and exhibited. If a member is at a distance from New York, in some town which may be far from photographic incentive, the organization will help form a center in that town, from which one will get inspiration and study through the parent body. There are to be monthly meetings at the National Arts Club, when interesting and instructive papers will be read, copies of which will be published and forwarded to every member. It is hoped to establish headquarters, and then, if a member is a visitor to New York, he will be privileged to visit these headquarters, see the latest products of the various workers, and meet those who are engaged in the very work you are doing; for it is only through the establishment of such an association, it is believed, that pictorial photography can win the appreciation and standing it deserves.

The Aims Are

To stimulate and encourage those engaged and interested in the art of photography.

To honor those who have given valued service to the advancement of photography.

To form centers for intercourse and for exchange of views.

To facilitate the formation of centers where

photographs may be always seen and purchased by the public.

To enlist the aid of museums and public libraries in adding photographic prints to their departments.

To stimulate public taste through exhibitions, lectures and publications.

To invite exhibits of foreign work and encourage participation in exhibitions held in foreign countries.

To promote education in this art, so as to raise the standards of photography in the United States of America.

The annual fee is \$5.00, and the Treasurer, Dr. Charles H. Jaeger, National Arts Club, 119 East 19th Street, New York.

Report of the Second Convention of the Middle Atlantic States, Philadelphia, March 27, 28, and 29

WITH a total attendance of 427, consisting of 267 members, 85 ladies, and 75 manufacturers and dealers, the Second Convention of the Photographers' Association of the Middle Atlantic States finished a most successful three days' session in Philadelphia, March 27, 28 and 29.

Tuesday, March 27

Address of Welcome, E. J. Cattell, Philadelphia City Statistician.

Response, William H. Rau.

J. A. Dawes, an interesting talk on studio work.

W. B. Poynter, demonstration of child-portraiture.

E. Meyer Silverberg, illustrated talk.

Henrietta Hudson, illustrated lecture on the "Commercial Uses of Direct Color Photography."

Wednesday, March 28

Henry A. Strohmeier, "The Photographer in His Business in His Community."

Katherine Jamieson on "The Women's Federation."

Pirie MacDonald gave his famous talk on "System."

Mrs. Frances Geissler, demonstration of home portraiture.

I. Buxbaum, a practical demonstration in modern lightings, enlarging and its possibilities.

Thursday, March 29

Business meeting: Reports of committees, election, selection of place of next meeting, etc.

Ryland W. Phillips, President Photographers' Association of America, "Stop and Watch Yourself Go By."

Jno. I. Hoffman, Secretary Photographers' Association of America.

Reception for ladies at Mary Carnell's studio. Clarence H. White in an open talk and discussion on pictures he submitted.

Professor Francis Harvey Green, business talk full of interest.

The various State vice-presidents were each given thirty minutes on the program and many interesting talks were given.

Next place of meeting to be decided by Board.

The officers elected: A. H. Diehl, Sewickley, Pa., president; Wm. C. Parker, Morristown, N. J., vice-president; Wm. Kingling, Baltimore, Md., secretary; W. I. Goldman, Reading, Pa., treasurer.

State Vice-Presidents: Samuel R. Gray, Philadelphia, Pa.; Henry A. Strohmeier, Newark, N. J.; E. F. Tevis, Wilmington, Del.; J. C. Christoff, Baltimore, Md.; I. C. Boyce, Washington, D. C.; W. A. Amon, Clarksburg, W. Va.

The ten pictures selected for the National salon and certificates of merit awarded were from: Bachrach Studio, Baltimore, Md.; W. L. Deal, Philadelphia; R. T. Dooner, Philadelphia; J. Mitchell Elliott, Philadelphia; Freeman Studio, West Chester, Pa.; Katherine Jamieson, Pittsburgh, Pa.; Miller Studio, East Orange, N. J.; Harry Schaeffer, Altoona, Pa.; Joseph Strickler, Pittsburgh, Pa.; George A. Wonfor, Camden, N. J.

The Eleventh Annual Exhibition, M. A. A. A. Camera Club

THE M. A. A. A. Camera Club, of Montreal, held its Eleventh Annual Exhibition from March 26 to 31, inclusive, in the Club Rooms, 250 Peel Street. Exhibits were received from many parts of Canada and the United States. Notwithstanding the unsettled conditions incident to the war, the artistic quality of the work submitted has been very gratifying, and made possible a very presentable exhibition of amateur photography. Mr. William Brymner (president of the Royal Canadian Academy), Mr. Sydney Carter, and Mr. T. H. Dupras acted as judges.

The prizes were divided into five classes: Portraiture, Landscape, Waterscape, Architecture, and Genre, a silver and bronze medal being awarded in each class. The prize and honorable mention list was as follows:

Class A, *Portraiture*. 1st prize, W. G. Fitz, "An Impression." 2d prize, T. W. Kilmer, "Three Score and Ten." Honorable mention, B. B. Pinkerton, "The Fortune Teller."

Class B, *Landscape*. 1st prize, W. H. Rabe, "Sunlit Woods." 2d prize, C. W. Christiansen, "Morning Shadows." Honorable mention, Wm. A. Guyton, Jr., "Caprice."

Class C, *Waterscape*. 1st prize, Albert Kelly, "Quebec Harbour." 2d prize, W. G. Fitz, "Study." Honorable mention, Dr. D. J. Ruzicka, "The Park Bridge." Honorable mention, Paul Wierum, "On the Mississippi."

Class D, *Architecture*. 1st prize, O. L. Griffith, "Night Rain." 2d prize, W. H. Rabe, "The Crescent."

Class E, *Figure Studies, or Genre*. 1st prize, W. G. Fitz, "Danse Javanese." 2d prize, O. L. Griffith, "Fantasie."

From Good to Better

THERE is no such thing in any art or science as the attainment of a certain level of proficiency at which one may remain stationary. We must move, no matter how slowly, backward or forward. We must either improve or deteriorate: as soon as we think that we have attained

perfection the process of decay has commenced. The artist who is satisfied with his work, who does not feel that his magnum opus is still in the future is to be pitied, for without the hope of better things he is prone to relax his efforts, and from excellence lapse into mediocrity. There have been few artists whose work could compare with that of Leonardo da Vinci, yet in his old age this great master drew the picture of a child in a go-cart, learning to walk, and beneath it inscribed the legend, "Still I learn."

This lesson may well be taken to heart by the photographic assistant, be he operator, printer, or retoucher. He should always bear in mind the old North-country dictum, "'That'll do' will never do." Day by day, not only for material profit, but for his own comfort and satisfaction, he should strive to improve his work, and the better he can do the better he will wish to do. It is only the duffer who is content just to scrape through.

The application of this principle to our daily work is a simple one. Let us take the case of a studio operator entering a new situation, and finding that he is expected to work with plates to which he has not been accustomed. His first negatives are not up to standard, and he forthwith condemns this make of plate and, if his employer be easy-going or ignorant, gets permission to revert to the one and only brand which he knows how to work. This is in itself a confession of incapacity, and such an operator's reputation is not likely to be enhanced by it. How much better he would appear if he had not been content with getting a good negative on one brand, but had studied the handling of many until he was sure that a plate which he could not manage was really a bad one.

The same thing is experienced in connection with lighting, especially with electric light. An operator gets a fixed idea in his head perhaps that no artificial light can be as good as daylight, and takes a melancholy satisfaction in proving his theory. All goes well until the employer meets a man who, with exactly the same system of lighting, is turning out fine work. Then he realizes that a change may be beneficial to his business, and there is trouble for the operator, which might have been averted if he had tried not to discredit the light, but to make the best use of it.

Printing affords many instances of the same sort of thing. The carbon worker tolerates "tint" and other defects because he has not the industry and intelligence to find out the cause. The bromide printer complains that the last batch of paper gives hard prints, because he will not modify his methods of working, and the retoucher does not put his very best into a bad negative because he fears that it will encourage the operator to give him a few more like it. We believe that there is no limit to the possibilities for improvement; when a high level is reached progress must become slower and slower, but there is always room on the top, and it should not be forgotten that a horse that can get his nose opposite the judge's box a fraction of a second before his nearest rival wins the race, and so it is in our daily work.—*British Journal of Photography*.



THE WORKROOM

By the Head Operator



WASHING
PHOTOGRAPHING POLISHED SURFACES
LETTERING NEGATIVES
MAKING A GROUND-GLASS SCREEN
STORAGE OF PLATES AND PAPER
THE MERCURY-FERROUS OXALATE METHOD OF
INTENSIFICATION
MAKING SOLUTIONS
VARNISH
WEIGHTS AND MEASURES FOR REFERENCE
HANDLING ULTRA-RAPID PLATES
ITEMS OF INTEREST
CARBON TRANSPARENCIES
ACTION OF POTASSIUM BROMIDE USED IN DEVELOPERS
FOR INCREASING CONTRAST IN THE DEVELOPED
IMAGE

NECESSITY FOR PURE CHEMICALS IN PHOTOGRAPHY
PREVENTING STAINED GASLIGHT PRINTS
A DARK-ROOM STOCK RECORD
A NOTE ON SPOTTING NEGATIVES
CLEANING NEGATIVES
CHANGING THE COLOR OF LANTERN SLIDES BY
REDEVELOPMENT
SOME CAUSES FOR WORRY: HOW TO REMOVE THEM
MATT AND GLAZED PRINTS BY THE CARBON PROCESS
WEAK POINTS IN THE BEGINNER'S OPERATING
LIFE-SIZE PORTRAITS
RECOVERING SILVER
CREASES IN BACKGROUNDS
FOR RETOUCHERS
DETECTING PINHOLES IN CAMERA BELLOWES
MAGNIFIERS

Washing

THE simple operation of washing, which so many workers are so apt to treat in a careless, haphazard way, as if it were a mere matter of form, is really of the greatest importance, and any neglect in this direction brings speedy retribution. The majority of photographic flaws and defects, of the spot and stain family, are, in fact, due to nothing else than inadequate washing at one stage or other. Even when the print or negative comes safely through without apparent blemish, it is not at all unlikely that rapid fading or deterioration has been rendered certain by a hurried and imperfect wash at the finish.

Washing in "Running Water"

A common method of washing is to place the negative or prints under the tap, in a dish, allowing the water to run or drip steadily on them. Unfortunately, the water is not changed so quickly as might be thought; that coming from the tap, for the greater part, merely runs over the surface of that in the dish, and it is only by gradual diffusion that any change occurs at all. This, therefore, is a very unsatisfactory method of hypo elimination, and does not really deserve to be called washing in running water.

It has, indeed, been shown that plates may be washed film upward in this way for as long as twelve hours, and yet give decided indications of hypo when tested. If the negatives can be placed film downward, supporting them at the edges in some way, the washing is very much quicker, for the hypo falls downward out of the film. But washing plates in horizontal dishes is not a good plan unless two dishes can be used, the water being changed occasionally and the negatives transferred from one dish to the other, cleaning out the first dish before refilling it, to remove any hypo that has settled at the bottom.

The same remarks apply to films as to glass negatives, with the addition that gentler handling is necessary. Care should be taken that films are kept moving, and not suffered to lie or stick together in a pile; but, in moving or shifting them, see that the sharp edges and corners of the celluloid do not cause scratches.

Washing Negatives in Tanks

Tanks in which negatives can be washed in an upright position are much better than dishes, since the hypo falls to the bottom; but they should be provided with a syphon for continually emptying the water, or there is no great advantage. The syphon automatically discharges the water at the same rate as it enters the tank from the tap, the latter being turned on just sufficiently to provide for this. In consequence, we have what is, in actual fact, washing in running water.

As, however, there is still a chance of hypo settling at the bottom of the tank, or in corners, there should be a wire rack provided for the negatives, with a handle for lifting; so that, at least three or four times during the washing, the negatives may be lifted out and the tank emptied and rinsed. With this precaution, one hour's washing should be quite sufficient. Tanks are greatly to be preferred to dishes for prints as well as negatives, on account of the greater volume of water contained. Syphon washers of various kinds have long been obtainable for this purpose. Paper obviously retains hypo more than glass, so that prints require to be moved about more and to receive a greater number of changes than will suffice for negatives.

Washing with Limited Water Supply

When the worker has not got a constant supply of water available, the best thing for washing negatives is to get a couple of fairly large pails and a small brass tap to screw on. Bore or

punch a hole in the side of the pail close to the bottom large enough to screw the tap into, taking care not to make it too large. Screw the tap in, and, if it leaks at all, stop round with putty. Fix two shelves at such a height that the syphon washing tank may stand on one of them, discharging into one pail placed on the floor, while the pail with the tap is stood on the shelf above.

The top pail is filled with fresh water as required, the tap being shut off while carrying it, the lower one being emptied at the same time, first plugging the syphon of the tank with a cork. If both pails are of identical size, overflow is impossible. Such an arrangement is also well adapted for washing prints, substituting a tilted dish for a print washer for the negative tank. A number of soakings and frequent changes are more effective from a hypo-eliminating point of view than prolonged washing in running water.

This is a fact that may be made the most of by those whose water supply is really limited in quantity. Two dishes or tanks (without syphons) may be used, the prints or negatives being given a five minutes' soaking in one, and then transferred to fresh water in the other, while the first is rinsed and refilled. Prints should be placed in a pile and squeezed gently between the hands at each change, allowing most of the water to drip off them before placing in the newly filled dish.

Under such conditions as those described eight changes will be sufficient for negatives and twelve for prints. This method sounds tedious, but it must be remembered that if comparatively little water is used, as will be the case, we must be prepared to make up by greater attention, and we shall have the satisfaction of knowing that our labor has been well expended, and our prints or plates are well washed.

Photographing Polished Surfaces

REFLECTIONS are sometimes a trouble to a photographer. One of the simplest ways of overcoming the reflections is to sprinkle the floor of the studio or room in which the objects are to be photographed sufficiently to render the air slightly moist. Then, when all is ready, drop a lump of ice into the vase or jug. This will chill it and immediately the moist air of the room will condense on it and dull the whole surface. The camera should be ready for the exposure (see that the lens is not clouded), for as the condensation continues it will begin to drip down the sides of the vessel. If more than one negative is required, remove the ice from the vessel till ready for the second exposure.

Another way for dealing with polished metal is to take a piece of putty—not too soft—and dab it evenly all over the bright surfaces. This will render them non-reflective and so remove the difficulty. The putty can be cleaned off and the gloss restored by means of a plate brush and whiting with a little benzole. Neither the dabbing with putty nor the using of ice can injure either glass or metal. Don't make the mistake of underexposure. Go for the shadows,

and not simply for the high-lights. These will be overexposed, and tentative development should bring out the shadow detail before full density is obtained.

One of the easiest objects to copy, so far as reflection is concerned, is a daguerreotype. The surface is so bright and so even that it reflects like a mirror—that is, it will reflect the light at the same angle that the light strikes it, and so, if only a sidelight is used to illuminate it, there will be no direct reflection into the lens of the camera.

Sometimes machinery has to be photographed. In the case of new machinery it may be painted or varnished, according to the whim or custom of the maker. There is a period in the finishing of a machine when the parts to be painted receive a priming coat. If the photographer can take the negative at this stage, his work is rendered easier. The great trouble with machinery is often its position. A machine is a solid object and stands where it is built—that is, a photographer cannot move it at will. If the machine has to be dulled to kill reflections, paint it over with flattening color. This can be cleaned off with a handful of cotton waste dipped in turpentine or benzoline.

In photographing silver plate we may find an inscription. Take the plate to a copperplate printer and ask him to ink the inscription. The letters, being now in black ink, will photograph much clearer, and a little turpentine on a rag will clean the ink out.

The photographing of gold letters cut into mottled and highly polished marble—on memorials—is often difficult; in fact, if the letters are small, it is often almost impossible to read them on the stone itself, especially if the gold has partly flaked off. The best way out of the difficulty is to mix some whiting to a stiff paste with a little water and fill in the letters with it until they are flush with the face of the stone. The white matt letters will now be distinguishable in the photograph. The filling can easily be removed from the letters by either washing or brushing it out.

Lettering Negatives

It is at times necessary to write or print some title on a negative. The most common way to obtain black lettering is to scratch the film away with a darning needle or sharp penknife and leave the letters clear glass. If it is wished to have black letters on a small strip of white, paint a narrow strip of Indian ink or other opaque substance on the face of the negative, and when it is dry scratch out the letters carefully. This will give black letters on a white ground. Another way is to bleach out the letters.

The white letters are somewhat simpler than black ones. Write on the negative with a pen filled with Indian ink, and the opaque ink will protect the paper and leave white letters. Or use ordinary ink with a very little mucilage mixed with it, and before it is quite dry carefully dust a good deposit of lampblack over it. If the reversed writing bothers, write the title in copying, mixed with a little yellow or ver-

million, to make it non-actinic, or with ordinary ink to which a little glycerin has been added, on a slip of paper. Then dampen the negative where the title is wanted and lay the inked side of the paper on the spot and leave it under pressure for a few minutes. Then peel the paper off, and a reversed copy of writing will be left on the film.

Or take a small piece of thin talc and write the title on it; then cement the talc with a transparent varnish to the film, with the writing in contact with the film. It will then be reversed. If white letters are required on a patch of black ground, cut away a small strip of the film, leaving clear glass only. Then write the title backward, in Indian ink, on the clear space. This is simpler to do than describe.

Another method giving white letters on silver prints is to write the title on the paper (before printing), using gamboge and a fine steel pen. Then print in the usual way, and the paint will wash off in the water, leaving white letters. The other plan is to write with a chemical ink (after toning and fixing) on the dry print. Such an ink is made thus: Potassium iodide, 40 grains; water, 2 drams; iodine, 4 grains; gum acacia, 4 grains. Write on a dark part of the print, and as soon as the letters turn yellow, immerse the print in a fixing bath for a minute or two, and wash thoroughly.

Making a Ground-glass Screen

A PIECE of finely ground glass is not difficult to make. Two pieces of ordinary glass, such as two spoiled negatives with the whole of the coating cleaned off, and a little fine knife powder form the materials required. One of the pieces of glass should be fastened by means of five or six brads or tacks to the surface of a bench or board, taking care that the heads of the tacks are below the top surface of the glass. A little knife powder is then dusted over the glass, and it is sprinkled with water, and then the other piece of glass being placed upon the top of it, the two surfaces are ground together with a constantly varying motion. By pressing on the top glass with outspread fingers it is possible to equalize the pressure over the whole surface. From time to time the two glasses are washed and wiped dry to see how the surface is progressing. If any spots remain bright, they may have especial attention by putting a little powder on them and by pressing on the top glass just over them while continuing the grinding. As both the surfaces in contact are ground in the process, it is as well to finish all the clear spots on both in this way, so that the result of the work is two focussing screens, both ready for use. A couple of half-plates should be ground in this way in less than a quarter of an hour, and if the powder used is fine the grain of the glass will be fine also.

The Storage of Plates and Paper

WITH the price of photographic materials at its latest level, it is necessary to avoid waste and deterioration, especially as regards plates and papers. The smaller sizes which are in everyday demand are usually not kept in stock

long enough for any serious damage to be caused, but even if only a month's supply be kept in hand, there is every necessity for providing a suitable storage place. The enemies most to be feared are damp and sulphurous vapors, and these are often present in conjunction in the dark-room. Sulphide toning has added greatly to the risk of the latter, and care should be taken that the sulphide of soda, or whatever evil-smelling substitute is employed, should never be used near the plate store. Gas stoves and coke fires were bad enough, but sulphide fumes are quicker and more thorough in action. Damp is a more insidious foe, for its results are not so apparent. Spots are seen in the film, but the platemaker is blamed and the real cause passed over. There is also a considerable loss of sensitiveness as well as of quality. It frequently happens that when large sizes, say 18 x 16 down to 12 x 10, are only occasionally used, the opened boxes are left in the dark-room, and when required for use are found to be hardly fit for exposure. This could be avoided by providing an airtight box fitted with a suitable holder for a pound or so of chloride of calcium. An ordinary uniform case will do, one of Silver's trunks is even better, and these may be made of any size. Money will be saved and quality of negatives improved by taking this simple precaution. We have alluded to the matter on many previous occasions, but even now it does not seem to be generally recognized that gelatin plates and papers are materials which readily absorb moisture and that the condition of dampness into which they can come under many ordinary conditions of storage are sufficient to make a marked difference in the results obtained with them.—*British Journal of Photography*.

The Mercury-Ferrous Oxalate Method of Intensification

ANYONE who has intensified a negative with mercury and ammonia, and then tried to repeat the operation knows that it is not practical. Not only does the negative gain nothing in density, but it suffers from stains or patchiness. There is one modification of mercury intensifier which is not open to this objection, but can be applied over and over again if need be, each application increasing the contrast to a definite degree. This particular process is that in which the bleached image is darkened by means of ferrous oxalate.

The intensification is best carried out by daylight throughout, and should not be put in hand until there is no doubt that the hypo has been completely eliminated. It is a good plan to make sure of this by well washing with water, in the usual way, and then leaving the negative for half an hour in a solution of alum. A convenient strength is one ounce of ordinary or potash alum to a pint of water. Hot water should be used to dissolve the alum, and the solution is ready for use as soon as it is cold, and can be poured back and used over and over again, provided it keeps clear. This will not only decompose the last traces of hypo (which should not be present), but will also harden the gelatin, which is desirable.

After the alum the negative may be washed

in three or four changes of water, and is then in the best condition for bleaching. It is bleached in a mixture of equal parts of a saturated solution of mercuric chloride and water, three drops of hydrochloric acid being added to each ounce of the mixture. When it is thoroughly whitened right through it may be taken out and washed.

The intermediate washing should be done with very dilute hydrochloric acid in place of water, say, one ounce of acid to eight or ten pints of water, and after half a dozen changes in this the negative should be left in distilled water for five minutes, well drained, and put into a fresh bath of distilled water for the same time. This is important, as, without it, the oxalate solution will react with the salts of lime always present, more or less, in ordinary water, and will form calcium oxalate, which is insoluble, and will leave stains in the film.

After washing the negative is put into ferrous oxalate solution to darken. This is made by mixing a saturated solution of iron sulphate with a saturated solution of potassium oxalate. The iron must be added to the oxalate, and not *vice versa*, or a clear liquid will not be obtained. Two drams of the iron solution, not more, should be taken to each ounce of the oxalate. In this the image gradually darkens, and the negative should be left until there is no doubt that the darkening action has gone right through. No harm will result if it is left in longer than is absolutely necessary.

Washing completes the process. For the reason already named the negative should be washed in three changes of distilled water, five minutes in each, after which it may be given a rinse in plain water, and set up to drain and dry.—*Photography*.

Making Solutions

IN many studios there is a great want of uniformity in the quality of the negatives which are to all appearances produced under exactly the same circumstances. There are times when they seem to run thin, then very likely there is a period of undue density, and after what may be termed a normal spell, for a few days, the negatives will show a distinct yellowness. It is quite usual to blame the platemaker, and in some cases a good brand of plate has been given up only to find a recurrence of the trouble with another variety. More frequently than not the cause of all this worry is a haphazard method of making the developer. This work is usually left to an assistant, even by operators who would not dream of allowing anyone else to develop their negatives, and, unfortunately, many assistants take the easiest way of doing things and are, moreover, not good at guessing at quantities of chemicals.

This was forcibly borne in upon us some time since when watching the compounding of the developer in the dark-room of a large studio. Sulphite, carbonate of soda, and hypo were all kept in well-made bins, and in each bin there was a plate box, which was used to dip out what was supposed to be the correct quantity of each for a Winchester of solution. Scales and weights stood handy for use but were disregarded. Having our doubts as to the accuracy of the

quantities being used we persuaded the operator to weigh them, with the result that errors varying from twenty-five to thirty-three and a third per cent. were discovered. If the amount of error had been constant it would not have mattered so much, but in this particular case three people were in the habit of making up developer, and each had his own ideas on the subject, a state of things which would account for the unequal results to which we have already alluded. A partial remedy would be the use of wooden measures, such as are used by corn-chandlers, which could be cut down so as to hold as nearly as possible the correct number of ounces of sulphite carbonate or whatever may be desired, each measure being kept for its proper chemical.

Another cause of uneven quality is the use of freshly mixed solutions at too high a temperature. Hot water is frequently used to dissolve sulphite and carbonate, and the solutions used before they have had time to cool down. This often results in the spoiling of the first one or two dishfuls of plates, which take on an undue density which no after-treatment can make normal.

We have mainly had the pyro-soda developer in mind, as it is the most generally used, but other solutions, notably that of amidol as used for bromide work, require the same care in preparation. The proportion of sulphite in this has a great influence on the quality of the prints, yet we have seen sulphite mixed for this purpose by the handful, the exposure being modified to suit the developer.

Toning and fixing baths made in the slipshod way cannot get even results. Some prints reduce unduly in fixing and others do not, all this meaning waste. In these hard times the photographer is very keen on getting an extra two and a-half or five per cent. discount from his dealer, but it is often a case of "pouring in at the spigot and running out at the bung-hole," for it is seldom that too little is used, and it is not only the waste of chemicals, but plates and paper, especially the latter, which has to be considered, besides the loss of reputation caused by the occasional issue of inferior work. It pays to do everything well in photography, and the making of solutions is not one of the least important operations.—*British Journal of Photography*.

Varnish

To render negatives and positives on glass, paper, or other supports impervious to the action of the air, damp, or changes of temperature, it is advisable to coat them with a varnish composed generally of a resinous substance dissolved in a volatile liquid, or collodion, or Indian-rubber in solution. The subjoined formula includes sufficient for almost all photographic purposes:

Varnishes to be Applied to Heated Negatives

Orange shellac	2 oz.
Sandarac	2 oz.
Canada balsam	60 gr.
Oil of lavender	1 oz.
Methylated alcohol	16 oz.
Bleached lac	4 oz.
Alcohol	20 oz.
Camphor	$\frac{1}{4}$ oz.

Varnishes which are Applied to Cold Negatives

Amber	1 oz.
Chloroform or benzole	16 oz.
Amyl acetate	10 oz.
Pyroxylin	144 gr.
Sandarac	40 oz.
Dammar	40 oz.
Benzole	1 oz.

Matt Varnishes for Positives on Glass

Make a solution of white wax in ether and apply to the positive.

Sandarac	1 oz.
Alcohol	6 oz.

Dissolve and add 1½ drams of castor oil.

Benzole	90 parts
Alcohol	10 parts
Gum dammar	8 parts

First dissolve the gum dammar in alcohol and then add the benzole. This varnish is of course inflammable.

Varnishes for Ambrotypes or Backing Positives

Asphaltum	½ oz.
Canada balsam	1 oz.
Turpentine	1 oz.
Asphaltum	½ oz.
Masticated rubber	15 gr.
Benzole	1 oz.

Retouching Varnishes

Dissolve gum dammar in turpentine until a consistence of thin cream is secured. To thin this solution, add turpentine; to thicken, leave the bottle uncorked for a day or two.

Sandarac	1 oz.
Castor oil	80 gr.
Alcohol	6 oz.

First dissolve the sandarac in the alcohol, and then add the oil.

Varnish to Render Films Transparent

White paraffin wax	6 oz.
Petroleum spirit	2 oz.

Anti-halation Varnishes

Aurine	2 gr.
Plain collodion	1 oz.
Powdered burnt sienna	1 oz.
Gum arabic	1 oz.
Glycerin	2 drams
Water	10 oz.

Shake well before using.

Colorless and Transparent Varnish

Copal (soft)	1 part
Benzine	10 parts

formulæ given in photographic literature are expressed in French (metric), English or American terms of weight and measure, or more simply in parts and volumes. The complications arising from the use of so many different systems are often the source of many difficulties in photographic practice, which, however, can be easily overcome by the adoption of one system—preferably the metric system, as the one most widely used by scientific workers—and the conversion of formulæ differently expressed into the terms of that system. To adopt this system the photographer needs only gram weights and cubic centimeter graduates for formulæ written in metrical form, and conversion tables for English weights, as given below.

*U. S. Weights and Measures**Volume—Liquid*

4 gills	1 pint
2 pints	1 quart
4 quarts	1 gallon

Fluid

Gallon.	Pints.	Ounces.	Drams.	Minims.
1 =	8 =	128 =	1024 =	61,440
	1 =	16 =	128 =	7,680
		1 =	8 =	480
			1 =	60

A fluidpint is sometimes called a fluidpound.

Troy Weight

Pound.	Ounces.	Pennyweights.	Grains.
1 =	12 =	240 =	5760
	1 =	20 =	480
		1 =	24

Apothecaries' Weight

lb.	3	3	3	gr.
Pound.	Ounces.	Drams.	Scruples.	Grains.
1 =	12 =	96 =	288 =	5760
	1 =	8 =	24 =	480
		1 =	3 =	60
			1 =	20

Avoirdupois Weight

Pound.	Ounces.	Drams.	Grains. (Troy).
1 =	16 =	256 =	7000
	1 =	16 =	437.5
		1 =	27.34

*English Weights and Measures**Apothecaries' Weight*

20 grains	=	1 scruple
3 scruples	=	1 dram
8 drams	=	1 ounce
12 ounces	=	1 pound

Fluid Measure

60 minims	=	1 fluid dram
8 drams	=	1 fluid ounce
20 ounces	=	1 pint
8 pints	=	1 gallon

The above weights are generally used in formulæ. Chemicals are usually sold by

Avoirdupois Weight

27.34 grains	=	1 dram
16 drams	=	1 ounce
16 ounces	=	1 pound

Weights and Measures for Reference

THE tables below represent the values and relative proportions of the principal weights employed in commerce and the arts. The

Tables for the Conversion of "English" Measures and Weights into "Metric" and Contrariwise.

Conversion of Grains and Ounces into Grams

	Grains to grams.	Ounces to grams.	Grains to the ounce = grams to 100 c.c.
1	0.06479	28.3495	0.22817
2	0.12958	66.9660	0.45635
3	0.19437	85.0485	0.68452
4	0.25916	113.3980	0.91269
5	0.32395	141.7475	1.14086
6	0.38874	170.0970	1.36904
7	0.45353	198.4465	1.59721
8	0.51832	226.7960	1.82538
9	0.58311	255.1455	2.05356

Conversion of Minims, Drams, Ounces, and Pints to Cubic Centimeters and Liters

	Minims to c.c.	Drams to c.c.	Ounces to c.c.	Pints to Liters.
1	0.05916	3.5495	28.396	0.56792
2	0.11832	7.9990	56.792	1.13584
3	0.17748	10.6485	85.188	1.70376
4	0.23664	14.1980	113.584	2.27168
5	0.29580	17.7475	141.980	2.83960
6	0.35496	21.2970	170.376	3.40752
7	0.41412	24.8465	198.772	3.97544
8	0.47328	28.3960	227.168	4.54336
9	0.53244	31.9455	255.564	5.11128

Relation of Metric to Avoirdupois Ounces and Grains.

Metric weights. Grams.	Equivalents in ounces and grains. Oz.	Grains.	Metric weights. Grams.	Equivalents in ounces and grains. Oz.	Grains.
1	0	15½	10	0	154
2	0	31	15	0	231
3	0	46	20	0	308
4	0	62	28.35	1	
5	0	77	30	1	25
6	0	92	35	1	103
7	0	108	50	1	334
8	0	123	500	17	279
9	0	139	1000	35	120

Relation of Metric to United States Fluid Measure

C.c.	Fl. oz.	Fl. dr.	Mins.	C.c.	Fl. oz.	Fl. dr.	Mins.
1	16	55	2	6	52
5	..	1	21	60	2	0	14
10	..	2	42	65	2	1	36
15	..	4	3	70	2	2	56
20	..	5	25	75	2	4	13
25	..	6	46	80	2	5	38
30	1	0	7	85	2	7	0
35	1	1	28	90	3	0	20
40	1	2	49	95	3	1	42
45	1	4	10	100	3	3	3
50	1	5	31				

1000 c.c. = 1 liter = 34 fluidounces nearly, or 2½ pints

Relation of Metric to United States Measures of Length.

1 millimeter	= $\frac{1}{25}$ of an inch.
1 centimeter	= $\frac{1}{10}$ of an inch.
1 meter	= 39½ inches.
1 kilometer	= $\frac{5}{8}$ of a mile.

To Convert the Centigrade or Celsi Scale into the Fahrenheit Scale

If above the freezing-point of water, multiply the degrees by 9, divide by 5, and add 32°.

Handling Ultra-rapid Plates

WHEN the dull winter weather comes along, photographers naturally look for some means of keeping their exposures short. The first thing they turn to is an ultra-rapid plate. Those who have not been accustomed to the handling of very fast plates, however, sometimes meet with disappointment. And yet, there is really no reason for disappointment, if a little care and common sense are used in the dark-room. It is only reasonable to expect that certain modifications in treatment will be necessary when a very fast plate is used instead of one of moderate speed.

The first thing is to see that the dark-room lamp is safe. A light that is comparatively safe with an ordinary plate may hopelessly fog a very fast plate. It is a good plan to use as little light as possible, especially when loading holders and when taking the plates out of the holders and putting them in the developer. It is during these operations that the plates are most likely to be affected by the light, because all plates are more sensitive when they are dry than they are after having been in the developer.

It sometimes happens that, even with the fastest plates, there will be under-exposure in dull weather. In cases of this kind the photographer has to get the most possible out of his plates. He has to get all the detail he can without getting harshness. The best way to do this is to develop in a tank, or, if a tray is used, to dilute the normal developer with an equal quantity of water and to prolong development. This method gives far more detail in the shadows, it improves the gradation, and it does not clog up the high-lights.

The temperature of the developer is another important matter. Some professionals never use a thermometer. These men would find that a few cents spent on a thermometer would prove one of the best investments they ever made. The best average temperature for the developer is 65°; in no case should it drop below 60°. It is quite impossible to get uniform results with fast plates, or, indeed, with any plates, if one batch is developed in a solution of 70° and another in a solution of 55°.

It should not be overlooked either, that fast plates require more time for fixing than do those of moderate speed. It is a mistake, when using any brand of plates, to take them out of the fixing bath immediately after the milky appearance has disappeared from the back, but with ultra-rapid plates it is more necessary than ever that this mistake should be avoided. Fixing should be allowed to go on for at least four or five minutes after all the visible silver has disappeared.

An ultra-rapid plate is a real help to professionals at this time of the year. Such a plate as the Seed 30 enables operators to get negatives of restless sitters on dull days, when with a plate of a slower brand it would be quite impossible. And the Seed Graflex is also being used to excellent advantage where even greater speed than the Seed 30 possesses is essential. For portraiture, however, the regular Seed developer, not the contrast developer, should be used.

for the Seed Graflex. The fast plate is more sensitive to light, therefore a safer light, or less light, should be used in the dark-room. It is capable of building up a good negative with a very short exposure, but the negative image, with all its shadow and half-tone, cannot be rushed up in a harsh, strong developer. Seed 30 and Seed Graflex are thoroughly reliable plates; one batch does not differ from another in speed, in fineness of grain, or in scale of gradation; but it is impossible to get uniform results if the developer is at a temperature of 70° for one batch and at 55° for another.—*Photo Digest*.

Items of Interest

MANY professionals do not realize how much their work would be improved by the use of a long-focus lens. Examples of distorted perspective, caused by working with the camera too near the sitter, can be seen in many windows and show-cases. There are bust portraits with their near shoulders looming up half as large again as the far shoulders; there are three-quarter lengths with hands out of all proportion; and there are large heads with noses that look so bulbous that they are a libel on the sitters.

In some studios a short-focus lens is the only one that can be used when full or three-quarter length portraits have to be taken. In these studios, however, the operator should be able to use a fairly long-focus lens for his bust portraits, even if he has to change his lens for the other styles. There is always a danger, where space is limited, of getting into the habit of making one lens do for all kinds of work. When this happens, the bad effects are very soon seen in the portraits.

Apart from the question of focal length, the choice of a lens is essentially a matter of personal taste—like the choice of a wife. How should any one else know whether you are likely to fancy an anastigmatic brunette or a soft-focus blonde? Many of the leading professionals use modern anastigmats, whereas other shining lights in portraiture stick to the old types of portrait lenses. Some go in for clean-cut detail in their negatives and get softness by various dodges in printing, whereas others prefer to get softness by using a lens that gives diffusion.

HERE are a few useful Don'ts for air-brush workers: Don't use the ink too thick; the consistency of writing ink is about right. Don't forget to clean the air-brush after using it. Don't lay the air-brush down on a table or other flat surface; hang it upright in the clip provided for the purpose. Don't put your finger over the front of the air-brush to see whether the needle is sharp; you will find that it is, but after being touched a few times it will be no longer straight. Don't let anyone but an expert try to repair your air-brush; send it to the makers.

It is not generally known that x-rays are used in cigar factories. They are being used to kill the destructive tobacco beetle. If the

beetle larva, which lives on the leaf, is not killed, it develops, becomes active, and eats its way through the finished cigar. In factories where x-rays are used no attempt is made to kill the larva until the cigars are finished and packed in boxes; the boxes of cigars are then passed through the x-rays; the exposure destroys all life without affecting the tobacco.

The scientific detective, too, has found x-rays of great value. During the past few months he has used them extensively in ferretting out contraband material. One dodge resorted to in shipping rubber across the Atlantic was to pack it in bales of cotton-waste. So carefully were the bales made up that to all appearances there was nothing suspicious about them. The scheme seemed likely to succeed until certain bales were selected for x-ray examination. The penetrating rays revealed a denser substance inside the cotton-waste. The bales were opened, and packed in every 350 pounds of cotton waste were 250 pounds of rubber.

THE rent paid for a photographer's show-window space, in a leading thoroughfare, is so high, compared with the rest of his premises, that he cannot afford to let it get into a shabby or neglected condition.—*Photo Digest*.

Carbon Transparencies

BY transparencies I refer, in this article, more especially to lantern slides; at the same time, what is here written also applies equally to all classes of transparencies, be they large ones for framing, slides for the stereoscope, or for the making of enlarged negatives.

It is strange that so much has been said and written upon the advantage of using the carbon process when making transparencies for use in making enlarged negatives, and yet *so little* upon its use for lantern slide work, most text-books and writers passing the subject over with two or three lines. Further, although our trade workers almost invariably use the carbon process for the production of large negatives, they almost as invariably send out transparencies made by any and every process but carbon, except where specially stated on the order. Why is this? Is it that they use the process that first comes to hand when doing this class of work; or is it that the photographic public will not have carbon work? That silver does not yield nearly so good results as carbon goes without saying, though I do not intend to infer that good lantern slides cannot be made by the use of the many brands of lantern plates in the market. Far from it. At the same time there is no process that yields the best results with such ease and certainty as the one under consideration; no method that is less likely to yield a transparency that is not good, and that at the same time is accepted, to save trouble, as good enough. Further, the very mention of the word carbon to most workers simply gives them fits, and one who knows the process is almost inclined to also have fits, *of laughter*, at the look of horror upon the face before him, knowing that the whole thing is so simple, as he does. In fact, an amateur, while watching me at work not long

ago, exclaimed, "Why, carbon is merely child's play." I do not intend to say it is so easy as this, yet, for certainty of results, once the initial stages have been overcome, no process can come near it, and, if anything, a transparency is more easy to make than an ordinary carbon print.

The tissue may be obtained either ready sensitized or not, according to the time it is likely to be kept by the user. Sensitizing is, however, so easy that no one need fear to undertake it, and sensitize his tissue one or two days before he intends to use it. This course will give him the advantage of being able to prepare just the number of sheets wanted; and, moreover, he can stock and prepare various colors, and thus there is no need for one to be somewhat bound down to one color for one day's printing.

The real trouble is that of drying the tissue, after the bath, and the following hints may be found useful. The sensitizing bath is prepared as follows:

Water (distilled for preference)	10 oz.
Potassium bichromate	$\frac{1}{2}$ oz.
Ammonia (liquid) .880	3 drops

The cut tissue is immersed in the solution for thirty seconds, taking care that no air bells form on the surface, it is then drawn over the edge of the dish, and laid upon a sheet of glass or zinc and lightly squeegeed (*with a flat, not roller squeegee*), to get rid of the surplus moisture, and hung up to dry, using either wooden clips or pins. The solution should not be over 80° F., but, on the other hand, the tissue may be allowed to remain in, in winter, for from forty-five to sixty seconds. It is best dried in a room in which a fire has been burning during the day, the sensitizing being done at night by gas or lamplight, the tissue is hung near the fire-place pinned to a clothes-horse or to the edge of the mantelpiece, the clothes-horse being, say, five or six feet from the fire, it will be dry, ready for printing in the morning. The blinds must, of course, be drawn, to exclude all white light. The *great point* in drying is to watch that it does not take too long, if it does trouble in stripping is likely to result.

Another point that frightens amateurs is the coating of the glass with the gelatin substratum; this is not necessary, neither is the operation of coating the tissue with collodion that is sometimes recommended; both these are intended to prevent the delicate high lights from being washed away during development, whether they do so or not is an open question; I have used the tissue with and without collodion, the glass with and without the substratum, and with and without either or both, and I have failed to find the supposed difference that is said to be shown, or any fault that could be put down to the non-using of, or any advantage that I could trace to the using of either the substratum or collodion. It may be that I always keep my tissue some two or three days prior to using, if this is so, I see no reason to deter others from doing the same, it certainly is in better working condition, if kept this length of time after sensitizing provided always that it is *kept perfectly dry*.

The great thing is to have the glass chemi-

cally clean. The tissue after exposure to light (with the usual safe edge using either a print meter or another negative as a guide to printing, *i. e.*, a negative of as near as possible the same density with a slip of P. O. P., by the time the P. O. P., is printed to *finished not toning depth*, the tissue will have had sufficient exposure), it is then soaked in cold water until it has become limp, the glass is then slipped under it, and both withdrawn together, the face of the tissue being in contact with the glass; it is next well squeegeed to get rid of any air bubbles, and put under blotting with a slight weight, for from fifteen to twenty minutes.

The time passed it is placed in warm water, and when the gelatin begins to ooze from the edges freely, the paper is stripped off, and the warm water gently laved or splashed over the print, which is now on the glass, until the excess of gelatin is removed, this being the development. When fully developed it is placed in cold water for a short time to chill the gelatin, and then given from three to five minutes in an alum bath, and finally washed for, say, five minutes, and put aside to dry.

When dry all that remains to be done is to mask and bind up as usual, but remember that the print, being reversed, the spots which mark the side to be placed next the condenser *must be placed on the glass side of the slide itself*, and not, as is usual, on the cover glass.

Any tissue may be used for the transparencies or lantern slides, but for the very best results I would say use the special transparency tissue, this contains more pigment and of a finer nature.

Transparencies or lantern slides may be produced in a variety of colors by using aniline dyes.

As a final word, may I say, never use the cushion-shape masks. For slides they are a mistake, and never should be used. *Square corners, please.*

To find the approximate focal length of a lens, focus on a distant object, *e. g.*, a church spire, and measure the distance from lens to ground glass. With R.R. lens measure from the stop; with a single lens measure from the diaphragm.

The Action of Potassium Bromide Used in Developers for Increasing Contrast in the Developed Image

It is of course well known that the addition of potassium bromide to developers produces, in varying degrees according to the developer employed, a retarding effect on the action of the developer, while increasing contrast in the developed image, within the limits defined in our previous study, as published in the *Bulletin de la Société Française de Photographie*, 1909.

Potassium bromide is not regarded as the only substance capable of increasing contrast in the developed image; it is commonly supposed that this property belongs not only to the various soluble bromides, but also to all substances which retard development. This theory has not, however, been made the subject of any decisive researches.

In the present study we have sought to elucidate the following points:

1. Is bromine the active and indispensable element in the manifestation of the above-mentioned phenomena, and can it exercise its action under any form in the state of a mineral or organic compound?

2. Are substances which contain no bromine, and which retard development, capable of producing the same effect as bromides on the contrasts of developed images?

3. Can the method of action of bromide in developers be deduced from the foregoing results?

For the purpose of ascertaining whether bromine is the active element in the action of potassium bromide on the contrasts of developed images we added to one of the developers most susceptible to the action of potassium bromide (hydroquinone), made up according to the following formula:

Water	1000 c.c.
Anhydrous sulphite	25 gm.
Carbonate of potash	38 gm.

and containing 0.24 grams of potassium bromide per 100 c.c., equimolecular quantities of the following bromides—quantities corresponding to the amount of potassium bromide producing the maximum contrast: sodium bromide, ammonium bromide, lithium bromide, calcium bromide, barium bromide, magnesium bromide.

All our tests were made as follows: Different plates were exposed under identical conditions by means of the Chapman-Jones sensitometric scale, and in such manner as to obtain in each case the appearance of the same sensitometer number. They were then developed comparatively with the test developer and with the same developer plus the various experimental substances. From the relative intensities of the faintest and strongest square we deduced the value of the contrasts of the image in each particular case.

All the soluble bromides gave similar results.

Hydrochromic acid and bromine water behaved in the same manner as the bromides.

The action of the *bromates* was slight, and could not be compared with that of the bromides; they had no effect on the image.

The action of the *hypobromates* is of no interest, as these substances do not exist in the pure state, and always contain bromides.

Among organic bromic compounds we experimented with *bromal* and *bromacetophenon*. These acted similarly to bromides, but probably under the influence of the alkali of the developer they partially saponify, giving alkaline bromides.

This appears to be confirmed by the fact that when added to a non-alkaline developer, such as diamidophenol, they are ineffective.

We also tested comparatively the action of the bromides and that of the other halogenic salts—chlorides, iodides, fluorides of potassium, of sodium, of ammonium and of lithium used in equimolecular proportions corresponding with the quantity of potassium bromide giving the maximum effect. None of these salts increases contrast; the iodides even diminish it, and during development transform the silver

bromide into iodide, necessitating prolonged fixation.

Further, not only do these substances, unlike bromides, fail to remove the initial fog of the image, but certain of them increase it.

In a further series of experiments we tested the action of various retarding substances such as sulphates, ferrocyanide and ferricyanide of potassium, and potassium bichromate, also the action of acids.

None of the former increased the contrast of the developed image. The acids we experimented with were hydrochloric, hydrobromic, hydroiodic, nitric, sulphuric, phosphoric, citric, and tartaric, of which hydrobromic acid alone increased contrast, probably by forming bromides with the alkali or sulphite of the developer. The other acids retard development without appreciably increasing contrast. This also is the case with soda bisulphite. In the case of non-alkaline developers—diamidophenol, for example—a small quantity of 40 per cent. soda bisulphite (from 2 to 5 c.c. per 100 c.c. of developer) *accelerates* instead of retarding development, and produces, not an *increase*, but a *diminution* of contrast. With more than 5 c.c. of bisulphite the time of development increases with the quantity of bisulphite, and up to 15 c.c. of bisulphite per 100 c.c. of developer, contrast is accentuated, but to a much smaller extent than results from the addition of bromide.

If too little or too much bromide be added to diamidophenol developer, its effect is scarcely perceptible; this, doubtless, is the reason why the action of bromide on this developer was for long unrecognized. On the other hand, its effect is very marked when used in the proportion of between half and one gram of bromide per 100 c.c. of developer.

To sum up, the property possessed by potassium bromide of increasing contrast in the developed image is not common either to haloid salts or to other substances capable of retarding development.

The preceding experiments seem to indicate that this property is peculiar to bromine in the state of soluble bromide or to organic compounds capable of forming a bromide with the alkali of the developer. While not enabling the theory of the action of bromide on developers to be elucidated, these experiments lead to the supposition that this particular action of the soluble bromides may be due to the combinations which they may form with the insoluble silver bromide, and which combinations may not be possible in the case of other soluble haloid salts.

Possibly these combinations are less easily reducible than the silver bromide itself under the influence of the developer, thus explaining the increase of contrast by the use of these substances.

The Necessity for Pure Chemicals in Photography

IN the conduct of any business where skilled labor is employed and the main object being to excel, it will always be found that the best of material must be used, although the cost of the material may often be high.

In one important branch of photography, viz., photo-engraving, it is a necessity that any chemical used should be of the highest purity. It is well known that in making up the enamel for the burning-in process upon copper, and the sensitive albumen solution for zinc printing, that the bichromate of ammonia must be of the finest description, and the albumen used should be from new-laid eggs; if the eggs are at all stale the sensitive mixture is useless.

Only a few years ago common washing soda was recommended in developing formulas, the results being constantly variable. Common washing soda is always very variable in composition. Under ordinary conditions every thirteen pounds of washing soda should contain three pounds of carbonate of soda and ten pounds of water of crystallization, but this is not always the case; there is oftentimes a large quantity of soda ash, as it is termed, which is nothing more than crude carbonate of soda, which is highly injurious when forming a part of the developing solution, causing fog all over the plate, or with bromide paper a gray veil is produced over the whites of the picture. Sulphite of soda, too, should be well looked after, for this is readily converted into *sulphate* of soda upon exposure to the air, and in some districts where the atmosphere is heavily charged with carbonic acid gas, both washing soda and the sulphite are partly converted into *bicarbonate* of soda. In either case this impurity is highly conducive to the production of fog. Both sulphite of soda and the carbonate should be well protected from the action of the atmosphere previous to use. Only too often this simple precaution is not attended to, the consequent result being a continued veiling all over the negative. The quality of the plate is at once considered defective.

When the wet collodion process was in universal use for everyday portraiture the use of triple crystallized nitrate of silver was a necessity. By the use of a chemical of such high purity the best of negatives could be made. Now that the gelatin dry plate has become universal it is just as necessary to pay attention to the purity of the developing agents to secure the finest quality possible in the resultant negative.

By the use of chemicals that contain various impurities, no matter what those impurities may be, the negatives produced are sure to be of a thin and weak nature, which after-intensification does not improve, only to a very slight extent; consequently every print suffers in quality entirely through the use of some chemical in the developer that cost only a few cents per pound less than the pure article. Competition in the manufacture of chemicals for photographic purposes for some years past has done a great deal to keep the purity to a high standard.

The consumption of hyposulphite of soda has increased enormously of late years. Every cask of hypo should be tested when first opened by making up a small quantity of solution and testing with blue litmus paper. If after a few minutes the test paper turns only faintly red it will indicate an acid condition. To correct this a 20 per cent. solution of carbonate of soda should be made up and a few drops added to the hypo solution. This will correct any tendency to

acidity. A weak solution of ammonia is sometimes used for the purpose. The use of this chemical is too risky, because of the caustic nature of this body, which will be sure to affect the color of the print, giving a tendency to a foxy brown after the print has dried.

One chemical that is very largely used at the present day is the chloroplatinite of potassium, represented by the symbols K_2PtCl_6 , which should contain 47.2 per cent. of the metal platinum. This salt sometimes contains too much chloride of potassium, this being a compound salt made up of the protochloride of platinum and chloride of potassium, the latter being an extremely cheap salt. If this salt is only of a light-red color, bordering upon orange, then it contains too much of the latter salt. Where it presents a deep blood-red color and the crystals are well formed it can be accepted as the true salt. When this salt is dissolved the water should be hot; this ensures perfect solution, as it is only sparingly soluble in cold water. When chloroplatinite of potassium is of the purest kind, many more prints can be toned with it because of its correct quantity of platinum. Although inferior qualities may be offered at a lower price, the amount of toning cannot be carried out that can be done with the pure article.

These remarks also apply to chloride of gold, which today is rarely found to be adulterated. If this chemical possesses any other salt it is generally sold under a correct name, such as chloride of gold and sodium, at a less price per ounce.

This compound salt, being an excellent one when made right for toning purposes, is preferred by many well-experienced photographers to the use of the pure chloride of gold, although it is difficult to conceive how the compound salt can answer better than the pure article in the line of gold toning. Practice alone with special toning solutions may have much to do in the production of pictures of a fine quality with the sodium-gold chloride, as it so often has to do with other practical points in the art of photography.

The use of impure bichromate of potash in making up the sensitizing solution for carbon tissue is very remarkable. The writer can call to mind a case where a considerable quantity of carbon tissue had been prepared in which a fresh sample of bichromate of potash had been employed to make up the sensitizing solution. Every care had been taken in the preparation and the tissue dried as usual in a room where thousands of square feet of tissue had been dried before. A small quantity only had been used upon the first day. A number of prints were made the second day, when upon trying to develop several large prints they turned out to be insoluble. Other prints were tried with the same result. All efforts to locate the cause were found to be useless, until a new sensitizing solution was made from another sample of bichromate of potash. The result was that the tissue that was sensitized, some being from the same rolls as before, turned out perfect prints, and possessed the same keeping qualities as hitherto. Upon testing it was found that the bichromate

was at fault; the material had been supplied from stock intended for electrical use, for the making up of battery solutions. For this latter purpose it presented no fault at all, but when employed as a sensitizer for carbon printing it was practically useless, causing a loss in good tissue, as well as time and labor. There can be no doubt that upon many occasions failure has been the result entirely through the use of impure bichromate of potash, the consequence being that the photographer who made a trial of carbon printing, not having succeeded, at once gave up any further trials because of his first non-success.

The use of bichromate of ammonia has been advocated by some workers. Of course this salt answers the purpose; the cost, however, is very high compared with pure bichromate of potash, at the same time giving no advantage. Pure bichromate of potash will cost about ten cents a pound more than the common article, and is capable of producing results more than ten times better than can be obtained with the common bichromate.

The use of sodium bichromate has been employed in carbon tissue sensitizing. There is, however, no advantage in its use over the pure potassium bichromate.

In the preparation of developers made with pyrogallol acid, it is well known that some makes of this chemical are superior to all others. To such an extent does this show itself that the developing power of some makes is quite 50 per cent. better, the quality of the developed image being superior in every particular. Although the price of pyrogallol acid varies with different makes, there should be no hesitation in paying a higher price for the best article.

There is not only economy in this, the good quality of the negatives produced will more than compensate for the small increase of first cost. Be sure in the first place that the chemicals are pure; then if there is a fault at all, it will be more easily located and rectified, and the resultant work will be both successful and satisfactory.

Preventing Stained Gaslight Prints

It is surprising how frequently one hears from one's fellow workers complaints about gaslight prints staining when in the hypo bath, and the query pages of the photographic press go far to indicate how very common this trouble is. An acid fixing bath has been suggested as the cure, and while admitting this in every way to be effective, the writer would point out that it is not necessary to prevent staining. The causes of stains are under-exposure and forced or prolonged development; or what is, in the opinion of the writer, an even more probable cause, that the developer is not washed out of the film of the print before it is put into an over-worked or exhausted hypo bath. It has often been noted that the first few prints passed directly from the developer to the hypo do not stain; it is always the succeeding ones that bring this trouble, proving that if in its weaker condition the solution is not washed thoroughly from the print, it will tend to oxidize before the hypo can get to work on the unused silver in its emulsion.

During a long experience of this process, in which the number of prints made on gaslight paper must have run into thousands, the writer has observed three simple rules, which, if followed, will make stained prints impossible: full exposure, fresh solution, and rapid development, and most important of all, a thorough rinse between development and fixing. If the developer is washed from the film, it is impossible for the print to stain. If the worker has a bowl of clear water on his table or bench, between the developing and hypo dishes, and the print is given a good rinse in this, a great part of the developer will be removed. The above, though exceedingly simple in use, will be found most effective in actual practice.—*Amateur Photographer.*

A Dark-room Stock Record

PHOTOGRAPHERS who make up their own solutions have need to keep a number of chemicals in stock, some of which are not very often used and may therefore be overlooked. To avoid running out of stock of a given reagent at a critical moment, the following method may be adopted with very little trouble. Go over the shelves carefully, and taking each bottle or jar in its turn consider what is the smallest quantity of each reagent that ought to be kept in stock to be on the safe side. This can be judged quite easily, a thick black line being drawn on the label to mark the danger point. Then take a packet of postal cards cut into half, or some thick white notepaper cut into quarter sheets, and write the name of one reagent on each card, filing them in alphabetical order in a small box. Write the names very boldly, so they can be seen in a poor light. There will be plenty of room on the cards to note any particulars that may be considered necessary, such as where purchased, price, date of purchase in the case of ammonium sulphocyanide and other reagents that do not keep well. These preliminaries will not take very long, and have only to be attended to once. A few colored metal clips, or "ticklers," as they are often called, should be obtained from a commercial stationer, or ordinary wire clips as used for holding papers together will serve as a substitute. Whenever the stock of a given reagent is found to be approaching the danger line, a clip should be fixed to the card bearing the name of that substance. The cards should be referred to periodically, and supplies ordered of any chemicals to which attention is drawn by a clip on the card. The card index serves another useful purpose, as it constitutes a complete record of the stock. Little-used reagents are often entirely forgotten by the busy worker, and only discovered after a fresh supply has been purchased. The cards save this unnecessary expense.—*Amateur Photographer.*

A Note on Spotting Negatives

THERE are very few negatives indeed made by beginners or even quite advanced workers that do not require a little elementary spotting of pinholes or defects in the film. There is, however, a right and a wrong way of doing this, and if the work is not properly done the result of the attempted cure becomes worse than the

original defect. Pinholes, large or small, are best blocked out by a small spot of water-color applied with a No. 2 brush. Many workers do not possess a proper retouching desk, and for simple spotting there is hardly any need for this. The plan adopted by the present writer is to hold the negative in the left hand near a window with a lace curtain, while the brush, charged lightly with water-color, is held in the right. The brush is simply brought straight on the pinhole, when enough pigment should be deposited to block any transparency. No attempt should be made to do any painting, as this is fatal to success, the idea being that sufficient pigment should be deposited at one simple touch of the brush to completely block out the defect. Another point that must be noted is that the depth of the pigment must coincide with the character of the negative at that part; it is useless to put a heavy deposit on a fairly deep shadow—such would print white, and give more trouble in spotting the finished print. The character of the spot should match, as far as possible the depth of the negative, and if this is done much spotting on the print or enlargement will be obviated. For instance, in landscape work, pinholes appearing against broken foliage, if carefully spotted, will be invisible in the finished print or enlargement. Perhaps the most difficult of all these defects to spot out are when the pinholes appear in an expanse of sky, or, say, upon the face of the sitter in a portrait study, and here again it is most important that the depth of the sky should be as exactly matched as possible by the spotting pigment. In heavy shadows parts of the subject, pinholes, except when lantern slides or enlargements of extraordinary size are wanted, may be ignored or spotted with the faintest possible trace of pigment. In short, the less spotting or retouching is done on the negative the better. The aim of the worker should be to resort to it only when absolutely obliged, and this, if ordinary precautions are taken, should be but rarely. It does sometimes happen, however, that slight defects, over which the operator has no control, are present in plates or films, especially at the present time, and it is here that the value of simple spotting comes in. If it is desired to remove the pigment due to faulty operating, a rag soaked in methylated spirit will be found effective; but before trying on a valued negative the worker should practise on an old or a waste one.—*Photography*.

Cleaning Negatives

WHEN removing the plate or film from the wash water, the film surface should be swabbed off with a piece of cotton batting soaked in water. It is a good plan to do this under a gently flowing water tap if possible. This will prevent the drying of dirt or grit on the emulsion, causing innumerable pinholes on the finished print. This fact is realized by most workers soon after they have made a few prints. But it is surprising how few of them appreciate the need for cleaning the back of a glass plate after it has dried, or of swabbing the back of a film negative after it is washed. It makes less

difference in the case of films as they ordinarily dry comparatively clean. Plates, on the other hand, can absorb moisture on only one side of the glass, the film side, and the other is invariably coated with a deposit when the water has evaporated. This should be carefully swabbed off with a moist cloth, especially if the negative is used in the enlarger where the outline of a deposit might be projected on the easel with the image on the film side, spoiling the enlargement. In some districts where the water contains considerable mineral matter and the deposit is likely to be heavy, it is best to swab off the back of the plate before putting it in the rack to dry, rubbing the glass quite dry before racking the plate. To clean the front and back of a strip of film, hold it above the washing tray and slip it between the first and second fingers, running them down the length of the film a couple of times to remove all excess moisture. Care must be taken not to scratch the film when doing this, especially in hot weather when the film is soft. Long parallel lines will result if the film is not handled carefully, and they will show up more plainly on the print than the negative.—*Process Monthly*.

Changing the Color of Lantern Slides by Redevelopment

THERE are times when making lantern slides that the time of exposure may have been somewhat short, and the forcing in development has given a very unsatisfactory color. Both these may be changed and intensity added so that, what would be otherwise a useless slide, may be brought up to a suitable color and the correct intensity gained by simple treatment.

The method of bleaching I have always found to affect the result, the bleaching mixture that I have found in my own practice, is the following:

No. 1 Bleaching Solution

Potass. bichromate	50 gr.
Water	5 oz.
Pure hydrochloric acid	1 dram

Place the defective slide in this after it has been washed for ten minutes in a stream of water. This is to make sure that all the hypo is washed out of the film. The time of bleaching is very short in many cases; only half a minute. The slide must now be well washed for several minutes in a stream of water, and redeveloped under ruby light, with any good metol hydroquinone; redevelopment will be complete in the course of about one minute. The slide must now be washed again and dried.

Sometimes the intensity after this treatment is insufficient, although such cases may be rare. Further intensification that will bring the slide up to the standard may be accomplished by bleaching it once more in the following bleacher and bleaching it with a solution of sulphite of soda:

No. 2 Bleaching Solution

Water (hot)	8 oz.
Bichloride of mercury	30 gr.
Potass. bromide	30 gr.

When this is cold insert the lantern plate. Let it bleach clean through, wash it thoroughly and blacken it by immersion in a strong solution of sulphite of soda (not sulphate). After this operation wash again well and dry. The slide now will have attained the requisite density, the color will be identical with slides developed with pyrogallic acid. To obtain slides of a chestnut brown color they must be bleached in the following bleacher:

No. 3 Bleach

Red prussiate of potash	60 gr.
Potass. bromide	30 gr.
Potass. iodide	20 gr.
Water ammonia	4 drops

This slide when inserted into this solution will now become bleached, when it must be washed well and converted into sulphide of silver by immersing it in the following sulphide bath:

Water	5 oz.
Sulphide of sodium (not sulphite)	60 gr.

The color will soon become a bright chestnut brown, when it must be washed slightly and immersed in a 10 per cent. solution of common alum for a short time, again washed well, dried and mounted with a suitable mat, or mask, and finished by binding in the usual way.

Some Causes for Worry, and How to Remove Them

IN his remarks on studio shutters lately the editor remarked that "if some means could be found to keep the shutter open during focussing the large bellows type of shutter would be ideal." I have had one of those shutters in constant use for over six years, and have never found it to fail since I put a little extra attachment to it in the form of a fine cord fastened to the right-hand half of the metal framework of the shutter and led through a small hole in the woodwork of the camera. The end of the cord hangs outside the camera, and a very light pull opens both halves of the shutter. On letting go the cord the shutter closes, and is ready to be opened again by pressure on the bulb. The cord can be held in the hand while focussing; or, if both hands are wanted free, the cord can be jammed by closing the focussing screen on it. When opening the focussing screen to put in the dark slide the cord is released and the shutter closes. The whole thing is so simple and sure that it should be fitted to all such shutters. The ball and rubber tube being used only to make the exposures, they last a long time. Mine has never once had to be renewed in all the six years, and works as well today as when first fitted. And should anything happen to the ball or tube, exposures can be made quite as well and quickly with the cord. The camera and stand are of the usual rigid kind found in most up-to-date studios.

Another thing that bothers a good many operators is the want of extra dark slides to fit the studio camera. This can be got over in quite a simple manner by fitting any other slides you have to the studio camera. Most photog-

raphers have a whole- or half-plate camera, and a number of slides to fit for outside work. To make such slides fit the studio camera, you have only to get a piece of board (cross-ended if possible) made to fit into the back of the studio camera, either to fit in place of the ground-glass framework, if this is removable, or, if not, just to slip in like a dark slide. Then in the center of this cut an opening the size of the plates you may have a number of slides to fit. Then take the reversing back of the outdoor camera, and fit it over the opening in the board by screwing three pieces of narrow wood round three sides, leaving the fourth side open to draw out the shutter of the dark slides. To render the joints light-tight pieces of velvet should be glued on. A few turn-buttons will hold the reversing back in its place, and you have a small hinged focussing screen in the center of the back of the large studio camera which is all ready to take the dark slides belonging to it. The back of the studio camera being square, the board with attached focussing screen can be reversed for either upright or oblong pictures, and proves a great convenience when a number of plates are required at one time. Perhaps to some this seems rather troublesome, but the whole thing can be made and fitted in a spare hour at any time. We are all quite well used to having loose panels to the front of our cameras to take different lenses, and this is only a loose back to our camera to take a smaller focussing screen and dark slides that would otherwise be doing nothing. The same remarks apply to any large outdoor camera where slides are few and an extra supply of plates of a smaller size is required. An extra panel to fit the back of the large camera can be made to take the focussing screen and dark slides of any smaller camera, and perhaps save the carrying of an extra outfit. By this means whole- and half-plate slides can be used in a twelve by ten camera, and half- and quarter-plate slides in a whole-plate camera.

Another source of annoyance at times, are the carriers for a smaller plate in a large slide. They have perhaps not so much use now as formerly, but still they are used, and the plate has a habit of slipping out of its place when least expected, giving us a plate only partly exposed, the other part being protected by that part of the carrier it has managed to slip behind.

The cure for this is to have all carriers made so that it is almost impossible for the plate to slip once it is in its proper place and the dark slide closed. To do this one has only to take a piece of stout black paper and cut pieces about half the size of each carrier. Now run some glue round three sides and press well down on the carrier, forming a sort of envelope in which the plate reposes. No reasonable amount of shaking will dislodge the plates in this, and one can set out with a light heart, knowing the plates, when you come back, will be in the same place as when you left.

It is little worries like the above which try one's temper, and if the cause can be removed in a simple manner by the exercise of a little ingenuity and time, it is surely worth the trouble taken.—J. PEAT MILLAR, in *British Journal of Photography*.

Matt and Glazed Prints by the Carbon Process

MAKING carbon portraits in 7 x 5 or 8 x 6 sizes by the usual double transfer process, employing a flexible support to develop the prints upon, always gives a dull or semi-matt appearance, but not a complete matt surface, one that should give no semblance of gloss.

By a slight manipulation of the Lambertype process a matt surface can be obtained, and, as two methods are available, I shall describe them as used in my general practice, which may prove of service to other photographers. The whole process of carbon printing will not be gone into here, because it is assumed that my readers are acquainted with the process.

The formula for the sensitizing solution is given, owing to its having answered well for the purpose, therefore it can be depended upon for all the usual kind of work in demand for good ordinary negatives, and as the tissue when sensitized with it will dry, and be fit for use in less than four hours, oftentimes it will dry in less than two hours, which in cases of hurry-up orders gives an advantage.

Sensitizer

Warm water	50 oz.
Potassium bichromate (powdered)	3 oz.
Ammonium carbonate	1 dr.
When cold add alcohol	20 oz.

The sensitizer must now be filtered and kept in a covered stoneware jar or a wide-mouthed brown colored glass bottle, when it will be ready at any time for sensitizing the tissue.

The best kind of plate to form the matt surface is the fine emery ground glass such as is used for focussing screens of the camera or emery ground opal glassplates. Although the latter are more expensive than the former, an advantage is gained by the use of these in enabling the exact quality of the portrait to be easily seen before the final transfer, while in the case of the camera screen plate some practice is required to decide at a glance by reflection from a dead white surface the correct depth for a finished print. This is not a difficult matter; it is simply acquired by practice.

The plates which may be 7 x 5 are washed in warm water, to which a piece of carbonate of ammonia has been added, about the size of a walnut, in half a gallon of water, has been found to answer the purpose. This will remove any greasy finger-marks or adhering dirt without injury to the hands. The plate while still wet must be rinsed in a stream of water and placed in an ordinary negative rack until dry.

Stripping Medium

Pure white wax	15 gr.
Ether (sulphuric)	5 oz.
Pure benzole	$\frac{1}{2}$ oz.

A small quantity of this must be rubbed over the ground surface of the plate, and polished off with light rubbing. Treat all the plates required for the work with this stripping medium and coat them with the following collodion, and as each one is coated place it into a grooved washing tank of cold water.

Film Collodion

Alcohol (pure)	5 oz.
Soluble cotton	50 gr.
Ether (sulphuric)	5 oz.

This collodion must be filtered, to separate any cotton fiber, or if time permits, let it stand undisturbed for a week, and pour off the clear portion for use.

The tissue of any appropriate color, having been exposed, may now be steeped in cold water until it lies flat. One of the prepared plates is now slipped beneath the tissue, the two are lifted together, and brought into complete contact by the use of the squeegee.

In the course of half an hour development in hot water may be proceeded with. As soon as the development is completed the plate must be washed in a stream of cold water, treated with the usual 5 per cent. alum bath, washed again and dried. The remainder of the process is the same as for double transfer: the prepared paper for the final support is softened in hot water, the dried plate having been allowed to soak in cold water for half an hour: the two are squeegeed together and allowed to become quite dry. The print is now separated from the glass plate by the insertion of the tip of a penknife at one corner, and lifted off, when it will be found to possess the exact matt surface of the plate.

If glazed prints are wanted all that one has to do is to use polished plate instead of the ground variety, all the other operations being the same, when a print possessing a very fine transparent gloss will result. The employment of grained zinc plates has been advocated by some workers. The use of these is not advised, for should they at any time become scratched, in the routine of general work, they are then irreparably ruined and cannot be utilized again, while glass, either the kind used for focussing screens or finely ground opal, possess no such objection. The only objection that can be urged against the use of glass as a temporary support is its liability to breakage. With careful handling this forms a very remote objection, and should it occur in many instances a 5 x 4 plate can be cut from a 7 x 5 and still be brought into use. If a print made as described should prove to be a little too weak, it can be easily intensified and utilized by using this intensifier.

Intensifier for Carbon Prints

Potassium permanganate	100 gr.
Water	5 oz.

Immerse the plate, watch the depth of color, as soon as this is reached, remove the plate, wash it well, dry, and follow with the transfer paper in the same manner as for the others.

The collodion film described will form a good protective coating to the print, either for the matt or glossy surface. The following process, which is the second way of securing a matt surface, can also be employed successfully, only in this case the use of rosin and beeswax is necessary, the plate being rubbed over with talcum powder in the first operation and finished with the wax solution described:

Resinized Solution

Yellow rosin	50 gr.
Pure beeswax (use no imitation)	50 gr.
Benzole	5 oz.
Spirit of turpentine	5 oz.

This will take about a day to dissolve completely, when it may be used upon a soft piece of rag, using only a few drops rubbed well over the talcumed surface, and polished with another soft rag, by light rubbing.

The exposed and well-wetted tissue is applied directly upon the plate, squeezed down, allowed to stand for half an hour as in the last method, and developed in the same way, finishing the operation with the double transfer paper and drying in the same manner. As soon as they are dry, the prints may be removed as with the collodion base, a matt surface being the result. Any spotting that is to be done must be made with an albumen color, such as can be purchased in tubes, or a little white of an egg may be used when applying the color, which is preferably made by rubbing a solid cake color with a drop of water and albumen upon a piece of ground opal glass, watching the tint upon the side of the opal.

Weak Points in the Beginner's Operating

SEEING, as we do, much work by immature portrait operators, which is sent to us for constructive criticism, we notice that the same errors, both artistic and technical, occur over and over again, and as it is possible to group them to some extent, we may do here in an article what we are continually doing in individual cases in answers to correspondents.

Dealing with technical matters first, we should be inclined to say that the weakest point is the focussing. This is not to suggest that the operator is unable to see when the image on the ground glass is sharp, if that were set as an actual problem. But it does often happen that the face is sharply focussed, and very little attention is given to other portions of the subject. Of course, if an ordinary half-plate landscape camera is employed, fitted with a lens of seven or eight inches focus, the aperture being $f/8$ or even $f/6$, there is little difficulty in getting the whole of the subject reasonably sharp. But focussing with a rapid portrait lens of fairly long focus is a much more complex matter. With a lens of 16-in. focal length working at $f/6$, very careful manipulation of the swingback or front, together with careful posing, will be necessary if the definition is to be good enough to avoid loss of structure. By loss of structure we mean a fuzziness, which makes it difficult to say what the material is of which an object is made. We are not advocating biting definition, but it ought to be possible to say whether a certain area represents some fabric or a polished piece of furniture.

It is, then, in the use of the swingback, both the vertical and the horizontal swings, that the beginner needs to practise, and as successful operating requires not only precision but rapidity of execution, he should be so familiar with the movements and the effects they give that he can unhesitatingly do the correct thing and

coördinate these movements with that of the normal focussing pinion or screw.

It is too commonly supposed that the swingback is a something which enables one to get the hands in focus at the same time as the head when taking a three-quarter length portrait. In actual fact the swings are quite as frequently needed for the focussing of a head-and-shoulders portrait. They are often neglected because the operator will not take a comprehensive view of the ground-glass, and because he is attracted by the "beautiful effect of the light on the face," or something of that kind, and overlooks the fact that the front of the dress is quite ill-defined and fuzzy.

Here, as in every other direction, observation must be cultivated and manipulative skill obtained by constant practice, and it is a good plan for every beginner to practise focussing for half an hour a day with some friend who will sit still and patiently. The focussing may be done first in the ordinary way, and then critically and deliberately checked by the worker himself. No plates should be exposed in this practice work, for the exposure of plates leads to a lack of concentration on the one point being practised.

Turning now to the artistic side, we may refer to the commonest failing in lighting—that of turning the face toward the light. It is curious that even a beginner should not recognize that to do so will give a more or less flat and insipid lighting. Probably this is merely a refuge, taken because of an inability to balance the light and shade of the face properly—that is, the light is harsh and the shadow is heavy—and because the operator cannot handle his light properly, he turns the face toward the light in order to avoid the heavy shadow. If he would remember that the light from the sitter's end of the studio gives brilliance and the light from the camera end gives softness, he could increase or diminish the strength of the lighting as desired, and would find it comparatively easy to obtain delicate modeling with just a sufficient touch of "sparkle." We are assuming, of course, that a proper arrangement of blinds for controlling the light is installed and that head screens and reflectors are available.

When we come to the posing and the "placing" of the portrait, we find the proportion of satisfactory results smaller still, for acuter perception and more training are here necessary than for lighting and focussing. Posing and placing are really variants of *design*, and the average Englishman has no feeling for design. Among the commoner faults we may mention the following: the head is too low down on the plate, suggesting a short person, and giving a lack of dignity to the portrait. The portrait is neither a head nor a half-length, but includes a part of the hands. It is not wise to lay down hard-and-fast rules in such matters, but, broadly speaking, if the hands show at all, they should be a considered part of the arrangement, and not suggest that they have been quite neglected and overlooked by just peeping in at the edge of the print. In the same way we have seen a sitting figure, taken against a white background, the vignetting just cutting off the feet and trouser

bottoms. Such a print includes either too little or too much; in other words it should have been a full length or else a three-quarter length. Prints of this kind suggest that the worker was either careless or unable to make up his mind what he really wanted on the plate. Posing need not be carried out from the artistic point of view to the destruction of any natural or characteristic attitude, but certain fairly well-defined "conventions" should not be lost sight of entirely.

In conclusion, we may remark that the only way in which the beginner can hope to overcome the difficulties is by tackling them individually. The amateur's plaint often is that there are so many things to think of all at once. So with portraiture and it is scarcely to be expected that full attention can be given to the posing and placing of the portrait if the use of the swingback is still an unmastered problem. One or other will surely go by the board.—*British Journal of Photography*.

Life-size Portraits

THE expression "life-size" portraits is used in two ways, and apart from this may give rise to some confusion unless applied with some common sense and some knowledge of the curious way in which illusion may enter as a factor. Some people, usually of slender education, refer to a life-sized portrait when they really mean full length, the idea of life-size to them evidently meaning all the life from head to foot. But the proper idea of a life-sized portrait is one in which the head is the same size as the original. The size of the average head is about $8\frac{1}{2}$ or $8\frac{3}{4}$ inches from chin to top of head, not allowing in this the hair. A woman's head is, of course, slightly smaller, perhaps $7\frac{1}{2}$ or $7\frac{3}{4}$ inches, measured in the same way. It does not follow, however, that we shall convey a proper effect if we make the head the measurement size on the enlargement, because first of all we lose the effect of binocular vision on a solid object, and second we must have the head in relation to its picture space. Just as placing a head too low or too high will convey the idea of shortness of stature or the reverse, so placing a "life-size" head on a small sheet of paper will give an impression of something bigger than life size, and an unpleasant impression at that. Probably the smallest size on which a life-size head would look well is 24 x 20, and we think we should on this size reduce the size of head a little so as to retain the effect of full-size without any risk of unpleasant effect. We think, too, that in these large sizes the definition obtained with modern lenses, or in the center of the field with the older Petzval portrait lenses, is too biting, and that better and more pleasing effects are to be got if some method is employed for softening the definition. This may be done in a variety of ways, the simplest of which perhaps are the racking in and out of the enlarger lens during exposure, or the placing of a piece of ordinary glass over the lens when exposing, so that the perfection of lens correction is slightly disturbed.

Recovering Silver. Report by Ansco Research Laboratory

WITH reference to the recovery of silver from exhausted hypo baths, we recommend the following as a practical method easily carried out in any studio:

1. Add enough acid to the old hypo bath (muriatic or sulphuric) to make it sour—about one pound to the gallon—and stir well.

2. Then dissolve sulphuret potassium in water—about one pound to the gallon—and add this to the sour waste solution. Add until no further precipitation takes place. Stir well and allow it to settle for from three to five hours.

3. Collect the precipitate on a muslin filter and ship to the refiners in a tight package.

The above method is subject to one minor objection. In these days practically all hypo baths contain alum, and therefore the precipitated silver sludge or mud is not an absolutely pure silver sulphide, but the loss is so small that it is not really worth bothering about.

With reference to recovering silver by deposition upon brass or copper: We have tried this in the laboratory, using copper gauze, but the results obtained are not very satisfactory. The deposition of silver is very slow, a complete quantitative precipitation of the silver not being possible in a reasonable time.

We have worked in the laboratory upon several methods for the recovery of silver from hypo baths, and the one which has given the best results is that involving the use of a saturated solution of sodium sulphide. The method is perhaps a little more troublesome than the use of sulphuret potassium, but the resulting silver is in a very pure state. The method used is as follows:

If the "hypo" bath contains alum, a small amount of ammonium hydroxide is added until a faint odor of ammonia is noted. The solution is stirred well and the aluminum hydroxide which precipitates out is allowed to settle, filtered and washed with hot water, the washings being added to the major portion of the filtrate. This step is necessary only when alum is used in the hypo bath, otherwise the direct precipitation of the silver with sodium sulphide, which is alkaline, would also bring down the aluminum hydroxide and the silver sludge would not be pure.

After the removal of the aluminum hydroxide, sodium sulphide in a saturated solution is added until the silver is completely precipitated as silver sulphide. This may be easily found out by allowing the sludge to settle, leaving the liquid clear, and then running in some additional sodium sulphide solution. If more sludge is formed, the silver has not been completely precipitated and more precipitating solution is added. The silver sludge is allowed to settle and the supernatant liquid poured out. The sludge is then washed with cold water by decantation. In this form the silver is sent to the smelter in a tight package.

I am giving you this second method as a matter of record, and also because you may find some photographers who would be willing to take the little extra trouble.

Creases in Backgrounds

EVEN when quite new some backgrounds will begin to crease, which means retouching the creases out in each negative as well as spoiling the look of the ground itself. These creases are caused by the rollers being too small and by the ground not being sufficiently well nailed on, too few tacks causing it to sag and stretch in places, and thus when rolled up it forms creases.

It is, therefore, desirable, before hanging the background up, to examine both roller and nails, for prevention is far better than cure.

Many ways have been suggested for trying to remove these creases, the principal drawback to them being that the back of the ground has to be damped, which frequently causes marks on the ground when dry. My own method avoids this, and is fairly successful when carefully carried out. It is as follows:

Take the background down overnight, and roll up very carefully and as tightly as possible by hand, carefully smoothing out each crease, tie up tightly, and leave until morning. Buy a yard of best unbleached calico and tear into long narrow strips, just wide enough to overlap the crease a little. Buy also a tube of good rubber solution (not the cheap and nasty chemical stuff which is of very little good).

Then, in the morning, carefully unroll the background on to its bottom roller, and lay down quite straight and smooth upon the studio floor, right side down. Next carefully smear one of the calico strips with the rubber solution and leave until quite tacky. Be careful that the whole of the strip (one side only) is thoroughly covered with the solution, especially edges and corners. When nice and tacky, unroll a few feet of the background, very carefully lay the strip quite smoothly and evenly over one of the creases, and press in tight contact with a roller squeegee. Dust over a little French chalk, and wind carefully and tightly up on to the top roller. Repeat this process until each crease is covered with a calico strip and lies quite smooth and flat with the rest of the ground.

The advantage of the rubber solution is that it dries almost immediately, and so does not cause patches on the face of the background. It is essential to roll the background up tightly overnight, so that the creases may flatten out somewhat before the strips are put on. It is also essential that only thin, stiff material be used, or it will cause a fresh set of marks on the background.

Make it a rule never to roll up grounds in a hurry and without looking at what you are doing, for they are very easily damaged, especially if the string or cord runs on crookedly when letting them down. Should the face of the ground be marked by attempts to damp the back and so get rid of the creases, carefully touch it up with a brush and some color until the marks do not show, flatted oil for oil grounds, and lamp-black, whitening, and size for distemper ones, adding ochre if of a warm brown tone.

Some time ago, in a large studio, I saw a method in use which struck me as being very good. Each ground was bound at the edges, eyeleted, and strained on to one of those bamboo frames

used for the white sheets used at lantern lectures. The frame had feet about a foot long, and these fitted into a stand on casters. There was about a foot and a half of the background left loose at the bottom to hide the stand. This I should think a very good way where there is plenty of room. The operator and his assistant simply lift out one ground, put it against the wall at the back, and drop in the fresh one needed. This, of course, needs room, but the grounds looked very nice.

With regard to my repairing method, I should fancy there might be a better material than calico, but so far I've not dropped upon it. It needs to be fairly stiff, and also quite thin. Perhaps some reader would know of something better. Tracing linen is fairly good, but inclined to wear out.—G. E. H. G., in *British Journal of Photography*.

For Retouchers

RETOUCHING is every whit as important as operating, and the retoucher can make or mar even the best operator's work. The reason so much retouching is so poor is because the retoucher takes the negative and sits straight down and starts off at it, without even one glance at the negative as a whole. This, I think, is most important, as it is very necessary to get a clear idea in one's mind of the style of lighting, and where the various high-lights *ought* to come. I say "ought" because lighting is a difficult and deceptive thing, and depends also upon the accuracy of the exposure, so that one often finds that the high-lights do *not* come where they should, and, therefore, it is the retoucher's duty very often to put them there.

The face is not flat, and, therefore, the high-lights will get gradually softer in strength. There is always, or should be, one leading high-light most often on the forehead, cheek-bone, or nose, and the others, like the notes in a scale of music, should gradually descend in key with this one. Also the high-light itself is not a flat, even patch, but has a high-light within itself. It is this that makes the high-light look round, and the want of it that makes work look flat, even poor and stodgy.

This little light within a light is not always in the same place, nor in the middle, but will vary according to the shape of the whole, and it is in order to see what this shape is that the retoucher should take a general all-over look at the negative.

Noses also seem with many to be a particular difficulty, and, indeed, they are. I think that the golden rule is to do as little to the nose as possible, for its shape is so easily altered. The two things that seem to have most effect on the nose are the high-light on the top of it and the corresponding dark shadow at the side, and while many retouchers pay a lot of attention to this high-light, the shadow is left to take care of itself.

The high-light should first be done, bearing in mind that the top of the nose is not flat, but round, and seeing that the high-light is the faintest shade stronger on the most strongly lit side of the face. Then very gently, almost tenderly, round off this into the shadow, and lighten the shadow just enough to make cheek and nose look round and soft.

Both the end of the nose and also the wings also need an extra touch or two, for the tip of the nose gets a little more light, and if the wing of the nose is neglected it makes it look flat, and as it often comes just in the long shadow it often loses this bit of light.

In the negatives of male sitters, too, there is frequently a dark shadow along the edge of the hair, which, unless it is softened makes it look rather like a wig.

No two chins ever take quite the same lighting, and it is the lighting that gives the chin character; therefore, take care to preserve, though at the same time to clean up this high-light, which will generally be softer than those higher up on the face.

The strongest high-light gives the key to the whole face, and where half-tone needs putting in, it should be done so as to balance with these high-lights.

Many retouchers get into the habit of sticking to one number of lead—often No. 3; but this is a mistake. With big heads, such as 1-1 or 12 x 10, the work done by a softer lead—say No. 2, or even 1—is much more suitable and effective, as well as being quicker. It, of course, calls for more skill and care in using, but the results repay the extra care. One naturally does not look for the fine work of a CdV head on a 1-1 one, yet it is put on by thoughtless retouchers, who also growl at the time "big heads" take. Working with a softer lead is also good practice and fosters delicacy of touch, and with freckled subjects give decidedly better results.

It is always desirable, where possible, for the retoucher to have a look at the proofs before the negatives are finally printed from, as, even with the best of retouchers, little trifles will and do escape notice, particularly if the retoucher should be called away, as is often the case with the receptionist retoucher. Roundness is always the secret of good lighting, and in ensuring this the retoucher has a large part.

With very strongly lighted heads the eyes are apt not to get enough light on them, so it is necessary slightly to strengthen the whites and high-lights of the eyes, but only just enough to make them correspond with the rest of the lighting; and there is also the little shadow under the nose, on the upper lip, that often gets little or no attention. Do not take it out, but see that it is not too heavy but in keeping with the rest of the face. All these little things help much toward really good results.—G. E. H. G., in *British Journal of Photography*.

Detecting Pinholes in Camera Bellows

WHEN a camera, either of the field or studio pattern, "springs a leak" most assistants I find start to locate the trouble by turning back the focussing screen, burying the head in the focussing cloth, and endeavoring to discover where light is getting into the camera. But a much easier method is to work the other way about, that is to put an electric light bulb inside the camera and then, in a dark-room, examine the outside of the apparatus for any escaping ray of light. The lamp can be conveniently fixed

in the camera by cutting a piece of cardboard to slide into the grooves for the dark-slide and cutting in this a slit through which a plug to fit an ordinary electric lamp holder can be passed. This excludes practically the whole of the light, but the focussing cloth can be thrown over as well to make certain of the complete exclusion of light from the room. If this is done the slightest escape of light from pinholes in the bellows or from the lens panels can be very quickly detected. Where electric supply is not available the same method can be carried out by using one of the small pocket electric battery lamps.—E. S. GWYER, in *British Journal of Photography*.

Magnifiers

ACHROMATIC lenses used as magnifiers allow a larger stop to be used, and still good definition obtained, than do single lenses. But when the magnifier is one of long focus, as is usually the case, the gain in using an achromatized lens is slight.

It is just as important to shade the magnifier as it is to shade the camera lens.—*Photography*.

PATENT NEWS

Under this heading it is proposed to include each month a list of all the U. S. Patents; and brief abstracts of the more important, and to include also such foreign patents as present special features.

Copies of any patent can be obtained from the Commissioner of Patents, Washington, D. C. Price, five cents each.

Camera. A. Kiss. 1218273.

Camera. E. E. Underwood & F. H. Reynolds. 1218135.

Finder for Cameras. M. J. Vinik. 1218342.

Apparatus for Cleaning M. P. Films. J. P. Vose & W. J. Owens. 1218137.

X-ray Tube. F. A. Wiggin. 1218026.

Cinematographic Apparatus. W. Bauersfeld. 1219221.

View Finder. G. W. Miller. 1219129.

Photometer. C. Laing. 1218946.

M. P. Machine. W. H. & F. A. Selby. 1219403.

Stereopticon. C. C. Clement. 1218928.

Camera. C. Boenmann. 1219801.

Camera Device. T. R. Schoenleber. 1219672.

Film Cleaning Apparatus. C. de Moos. 1219712.

Film Pack. A. A. Ruttan & C. H. Hutchings. 1219588.

Photographically Sensitized Medium. A. E. Jacobson. 1219739.

Plate Holder for X-ray Exposures. H. G. Leisenring. 1219965.

Camera Device. N. B. Conway. 1220957.

Cinematograph Apparatus and Film. S. Cocanari. 1220195.

Flash Light and Camera Shutter Synchronizer. C. A. Ellsworth. 1220325.

Photograph Mount. E. N. Lodge. 1220354.

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COMMERCIAL PHOTOGRAPHY¹

By T. A. SCOTTON

THE commercial photographer—and by this I mean the man who deals with every class of professional photography outside pure portraiture—must be ready at very short notice to go anywhere and photograph anything and at any time. This can easily be proved by looking at the various publications containing commercial photographs; the numerous branches are so varied that it would be impossible in one paper to deal with the subject in its entirety, and as my work lies among engineering and railway work, I must confine myself more or less to this part of the subject.

With respect to apparatus, the improvement in speed, fineness of grain, and latitude of dry plates, in conjunction with the fine quality of modern lenses, enables the worker to do most outdoor work with a comparatively small camera and good enlarging apparatus, and this has far-reaching effect on deciding the

size of camera to use. The whole-plate camera, with plenty of rising and swing front and back, is perhaps as useful a size as any for the professional photographer, but there is no doubt that much useful work can and is being done by enlarging from quarter-plate and smaller sizes. Of course, we must except groups containing a large number of figures, for which I consider that direct work will always hold its own, as such prints are examined more closely than landscapes.

The choice of a camera is a matter of individual taste. The commercial photographer must possess a generous measure of capabilities for his abundant difficulties—a master craftsman whose work generally begins where his fellows are content to make an end. Compare the work of a portrait photographer with that of the commercial photographer. In portraiture working conditions are fairly constant, same lens, same speed of plates, similar lighting, year in and year out. On the other hand, the commercial photographer's conditions are ever vary-

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¹ A paper read before the Photographic Convention of Photographers of Great Britain.

ing, and there must be constantly new ideas to fit new requirements—landscape, machinery (in and outdoor), copying paintings, linework, interiors, architecture, furniture, flashlight work, etc. Consider the difficulties involved by this variety. In plates he must be familiar with and use slow and fast ordinary brands, process, panchromatic, isochromatic, and lantern; used with or without screens, blue, red, green, or yellow, as required. His lenses must be from very wide angle to the telephoto variety.

With regard to plates, the excellence of manufacture is now so uniform that there is very little in the matter of choice, but I will say this: *always* use backed plates. I have done so for many years, and the extra outlay is more than compensated for by the improvement in the negatives, absence of halation, etc. When changing plates away from home I carry a folding ruby lamp (this takes up very little space), and change in my bed room at dark. Previous to photographing a locomotive or any other piece of machinery, if the best result is required the whole of it should be painted in a slate gray color, and the color mixed so as to dry absolutely "flat"—that is, without any gloss. If the parts underneath the machine in shadow are required to be shown, they should be painted a lighter shade, and, of course, the deeper the shadow the lighter they should be painted; in extreme cases even white. This is required under a locomotive. Bright parts may be painted in a similar manner, but by a variation in color, so as to show sufficient contrast. Care must be taken also that oil does not run out of the bearings, as this leaves dark and glossy marks, which are very difficult to retouch out. Whenever possible, machines should be photographed indoors; if done in the open there is a strong top light, which causes deep shadows. It is advisable to use a rough sort of light background if possible, and afterward block out the whole of the parts not required.

I often see queries in the photographic papers asking for advice respecting the blocking out of backgrounds in negatives, and the general replies appear to be use some form of levigated oxide of iron, either grinding from a cake or using from

a bottle. My experience of such mixtures is that they either chip off or, when there is any damp about, soften and stick to the printing paper. I will now give you the method which I have been using for over thirty years. The foundation is stick Chinese ink, but this must not be used alone. Procure a piece of smooth slate, and place thereon, say, half a teaspoonful of water; commence grinding the Chinese ink in this, and as the grinding proceeds add a little orange chrome (chromate of lead); the right amount can only be found by experience, but to the above quantity of water a piece the size of a pea will be about right. As soon as the mixture shows opaque by transmitted light, stop grinding, and it is ready for work; if too thick for a pen dilute a little of it with water; it will flow well from a drawing-pen, and such article I always use for going round the outline of locomotives, etc., using, of course, set square or French curves as necessary. This mixture will not chip nor split the varnish. It is quite unaffected by damp, quite opaque, flows from pen easily, and is reliable in every way.

Exposures should always be ample. An under-exposed plate will never yield that soft, harmonious result (however helped by skilful development) which is so necessary in successful photographs of machinery. I keep a record of every exposure I make—subject, light, time, and date. This is not only very useful at the time of developing, so as to have a clear idea of the circumstances surrounding the exposure, but at other times when one has a similar and perhaps very difficult subject to deal with. My record extends for twenty years.

It is useless to attempt any very extended range of work unless well equipped with lenses of varying focal lengths, but it is not necessary that they should be of a very expensive type. The telephoto lens, too, is a very useful addition where enlarged portions of distant objects are required. One important point I should like to draw attention to, which is often overlooked; this is the effect of the focal length of the lens upon the perspective of the picture. A good many objects have to be dealt with at close quarters, and if a

short-focus lens is used objects are badly distorted. In catalogue work this is a serious disadvantage; hence it is necessary, if possible, to employ a lens which allows of a sufficiently distant standpoint being taken to avoid the violent perspective. It is desirable that one should use a lens of at least double the focal length of that used for landscape work, say not less than 20-inch focus, bearing in mind that it is the man behind the lens, and not the lens, that counts.

My chief sizes of cameras are $8\frac{1}{2}$ in. x $6\frac{1}{2}$ in., 18 in. x 16 in., and 26 in. x 21 in., and I frequently have to make enlargements from each of these sizes. For many years I used daylight illumination, consisting of a mirror fixed at an angle of 45 degrees outside the enlarging room window. This method proving unsatisfactory owing to the continual changing of the light and foggy or dull weather, I cast about for a successful method of artificial illumination. A space 8 ft. x 4 ft. outside the room was boarded up and roofed in, and two enclosed arc lamps with parabolic reflectors fitted up, with the light shining on a board painted dead white. The light is in turn reflected from the board through the negative; distance of board from negative, 2 ft. This gives a very even illumination, no condenser to bother with, and, using a quick lens, 24 in. x 20 in. enlargements from whole-plate negatives only require exposures varying from fifteen seconds to one minute, according to the density of the negative. The opening in the enlarging room should be cut large enough to take the largest size camera (presuming an enlarging apparatus is not available), and a sliding shutter with an opening cut the size of each sized negative in each shutter, changing the shutters as required. A board slung from wood rails suspended from the roof, or a similar arrangement on wheels running on rails let into the floor, makes a satisfactory way of supporting the bromide paper, and the Amidol developer will take a lot of beating for uniform work, especially if the enlargements are to be sulphide toned.

I recently had a good number of brass castings and details to photograph, and as they were heavy some means of plac-

ing them in position other than hanging on the wall had to be adopted. The method of pointing the camera toward the ground is too well known to need description, but as the finished photographs had to show a clear margin the following method was adopted to ensure getting the articles in their proper position in front of the lens: A sheet of buff cartridge paper was laid on the floor for the background, and upon this was placed four laths tacked together to make a rough frame, which by calculation just came into the dimensions required. It is then a simple matter to place the articles in position inside the frame, afterward removing this away; and by ruling pencil lines on the focussing screen half an inch apart in both directions, it was the easiest thing possible to see by these lines that the numbered tickets, titles, and the articles themselves were all square with one another. This method is necessary, as by the curvature of the lens any distortion toward the edges is counteracted by moving the articles until they came into line with the marks on the focussing screen. The articles were painted in flat gray color.

Cut glass should always be photographed with the light coming through from the back at an angle, and the lens carefully shaded, so that no direct light enters it.

To many photographers flashlight photography is a bugbear, some shirk it altogether, others do the best they can without proper knowledge, and some understand the principles involved, and make a success nearly every time. I am afraid that in many cases little or no care or forethought is exercised in preparing for this special and difficult class of work.

Flashlight photography is feverish work at its best, and the apparatus and materials used should be as perfect as can be secured; nor is that all that is necessary: the photographer must thoroughly master the method of using them, and this can only be done by careful practice and rehearsal under what may be considered average conditions.

The principal points to be considered are the maximum aperture of lens at which sufficient depth can be obtained; secondly, the position of the lamp (par-

ticularly as regards height); and, thirdly the quantity of powder necessary properly to illuminate the most distant part of the room or group, the distance between the light and figures being an important factor. The lamp should be at least 10 ft. from the floor for a large group, and well to one side of the camera. Great care must, of course, be taken to prevent any direct rays from the flash reaching the lens. It must be remembered that when using a flash lamp we are dealing with a near source of light, and that the falling off in illuminating power is very great. The amount of powder to use can only be settled by experiment, but in the case of large work one has to think in ounces, and not in drams or grains, which would suffice for a single figure. It is impossible to be too cautious in the handling of explosive flash mixtures, and it is wise to put only enough for one exposure in each bottle. Flash powders must always be used upon an open tray.

The enlarging room makes a capital place to make lantern slides by reduction. Place the negative in the same place as was done for enlarging, and point the lens and camera toward the negative. The light from the enclosed arc lamps gives a very soft and suitable illumination. The method of introducing clouds is as follows: Having finished and dried the slide, it is placed in the dark-slide and both shutters drawn; the cloud negative is then put in the same position as was previously occupied by the negative. Now by raising or lowering the rising front it may at once be seen which portion of cloud suits the subject best. The dark-slide is now taken into the dark-room and a lantern plate inserted, leaving the lantern slide in front of it. The plate is then exposed, the slide itself acting as a shield to protect the plate from receiving any exposure where it is not required. The plate is then developed and dried and put into correct register with the picture, and the two bound up together.

The storage of negatives and method of registering are an important point to be considered. I have one cupboard which, together with its contents, weighs

10 tons, and, of course, there are some thousands of negatives to make such a huge weight. The shelves have strips of wood $\frac{3}{8}$ in. thick sprigged on, leaving $\frac{3}{8}$ in. between to contain two negatives. On the front of each shelf a strip of paper is pasted bearing the numbers, which have already been placed on the corner of each negative in waterproof Indian ink. Knowing pretty well the sizes of negatives which are in greatest demand, the numbers are apportioned in a manner somewhat as follows: $8\frac{1}{2}$ in. x $6\frac{1}{2}$ in., 1 to 10,000; 10 in. x 8 in., 10,001 to 12,000; 15 in. x 12 in., 12,001 to 15,000; 18 in. x 16 in., 15,001 to 20,000. A register containing these numbers is prepared, and the titles, together with size, date photographed, etc., are inserted as the work proceeds.

I have also an index book for each size, and the negatives are entered under the letter which is most suitable. In case of landscapes the name of place; for instance, a view of Perth would be entered under "P," engines under "E," carriages under "C," and so on. By this means any negative can be found in a very few minutes, and after a good many years' use of this system I find it is quite satisfactory. It is essential that some means should be found to enable copying through the camera of documents, etc., to be done expeditiously, and as daylight is so variable I had two enclosed arc lamps, with parabolic reflectors, installed, and this part of the work can be done better, with more certainty, and at any part of the day.

It is highly desirable that people purchasing furniture should see the article themselves, but where this cannot be done the aid of photography is invaluable when the work is properly done. Until recently it was not possible to give anything but an indifferent representation of objects having rich coloring, but the Wratten panchromatic plate, which is sensitive to all colors, has remedied this, and the booklet, *The Modern Method of Photographing Furniture*, published by Eastman Kodak Co., should be in the hands of everyone interested in this subject, and also the one entitled *The Art and Practice of Photographing Paintings*

ENLARGEMENTS ON CONCAVE OR FLAT-GLASS SURFACES

By "CHEMIST"

THE production of enlargements upon concave glass surfaces without the aid of the transfer process is often desired by many photographers because there is a demand for this class of photograph. It is advisable to procure oval glass plates, the concavity of which is not too deep, for two reasons: first, it is somewhat difficult to secure an even focus; and, second, the sensitive surface must not be too thick in the center of the plate.

There is a method by which these enlargements may be produced very satisfactorily by means of a collodion emulsion, which must be prepared with care, and kept at all times away from actinic light. A number of plates may be prepared, dried, and stored for use, and to be successful by this method great care must be exercised in cleaning the plates in the first instance.

The number of plates desired, whether flat or concave, should be procured and cleaned in a strong, hot solution of common washing soda. With a mop made by tying a piece of clean rag on the end of a strip of wood, well rub the plates over with this soda solution, rinse in clean water, then place them into a bath of muriatic acid, 3 ounces; water, 60 ounces. After soaking in this acid solution until the plates are cleaned, they must be rinsed singly in running water from a faucet, and the surface upon which the enlargement is to be made must be flowed over with the following preparation: albumen of one fresh egg, and water, 40 ounces; strong liquid ammonia, 1 dram. This must be prepared beforehand, and well shaken in a bottle of the capacity of 80 ounces and filtered through two thicknesses of well-washed cheese-cloth. In pouring this mixture over the plate, be very careful not to produce any air-bubbles. This may be accomplished by allowing the lower edge of the plate to touch the side of the glass graduate from which the albumen solution is being poured. The plates should

now be placed in a clean rack to dry. When prepared in this manner the plates will keep well for two months in a clean and dry grooved box.

The next solution that will be required will be the sensitive emulsion, which is made up as follows:

Collodion Emulsion

Pyroxylene (gun cotton) . . .	80 grains
Sulphuric ether (sp. gr. 0.720) . .	8 ounces
Pure alcohol (sp. gr. 0.820) . . .	5 ounces
Castile soap	1 dram
Bromide of ammonium	56 grains
Bromide of cadmium	56 grains

Place the pyroxylene in a clean bottle with 3 ounces of alcohol, shake well, then add the ether. Shake until all the pyroxylene is dissolved. Add the two bromides to the remaining 2 ounces of alcohol, and when dissolved pour into the ether mixture, shake well, and add the castile soap cut into very thin shreds.

As soon as this mixture is in a state of solution it is ready to be sensitized, the sensitizing solution being prepared as follows:

Nitrate of silver	250 grains
Pure alcohol	2½ ounces
Distilled water	2 drams

The nitrate of silver must be powdered and placed in a glass flask and covered with 2 ounces of alcohol and 2 drams of water. Heat must now be applied to the flask, and a gentle shaking of which will complete the solution of the nitrate of silver.

The following operations must be carried on in the dark-room: Pour a little of the hot nitrate solution into the ether mixture, cork the bottle quickly and shake well; then little by little add the remainder of the hot nitrate solution, shaking well between each addition; rinse out the flask with the remaining half-ounce of alcohol, adding this also to the mixture, shake it vigorously, and allow it to stand for about twelve hours to ripen. At the end of this period there must be added another 30 grains *each*
(253)

of bromide of ammonium and cadmium, dissolved in half an ounce of alcohol; the mixture must now be shaken well and poured out into a small, clean porcelain tray to set.

As soon as the ether and alcohol have evaporated the remaining emulsion must be cut into pieces with a bone knife and allowed to dry (all these operations must be conducted away from actinic light). When the shreds are dry they must be washed by tying them in a folding of cheese-cloth and suspending them in a stoneware crock or jar filled with clean water. This must be changed several times, so as to wash out all the *salts* of decomposition. The shreds may now be placed upon a clean blotter to take up all the surplus moisture, then placed in a darkened closet to dry. When dry the fluid emulsion can be made up by dissolving 24 grains of the dried shreds in 1 ounce of solvent made of equal parts of alcohol and sulphuric ether, and filtered through a loose tuft of absorbent cotton into a suitable, wide-mouthed, amber-colored bottle. The emulsion is now ready for use.

To prepare the plates take one of them and pour upon the albumenized surface some of the emulsion, allow it to flow all over the surface, then drain off the excess of the emulsion into the stock bottle, wave the plate gently in the air, then place aside to dry. Treat all the plates in the same manner, and as soon as dry they are ready for use.

Having the enlarging apparatus ready, place in the negative and focus upon the screen to the size required, place the sensitized plate in position, and expose.

Black Spots on Platinum Prints. It will sometimes happen, either through overlooking a pinhole on the negative that ought to have been stopped up, or through some chemical dust falling on the print, that an otherwise perfect platinum print is defaced by one or two very small black spots. Those who are troubled in this way may like to know that it is not difficult to remove these with the point of a knife, or other suitable instrument. They ought, of course, to be avoided in the first place, but if they are present all that is to be done is to pick them out boldly and bodily. After the

From a cabinet size head to 8 x 10 the exposure, with a good light and a rectilinear lens of about 13 inches focus and stop *f*/16, should be about one minute. Proceed to develop as follows, these solutions being all made up previously:

1. Pyrogalllic acid	192 grains
Alcohol	2 ounces
2. Bromide of potassium	20 grains
Water	2 ounces
3. Carbonate of ammonia	6 grains
Water	3 ounces

To develop take 10 minims of No. 1, 4 minim of No. 2, and 1 dram of No. 3; take the exposed plate, rinse it carefully under the faucet, drain the plate slightly; then pour the developer over the plate, not in a tray, but at one corner or outer edge by the thumb and finger of the left hand; then rock the developer over the plate to and fro until the image makes its appearance; then add 8 minims of No. 2 and 2 drams of No. 3; mix this with the developer on the plate, and continue development until the image is well out; throw off the developer, wash the plate gently under the faucet, and fix in a solution of hyposulphite of soda, 2 ounces; water, 6 ounces. As soon as fixed wash in a gentle stream of water for half a minute, then place in a rack to dry. When dry the plate should be varnished with any good clear photographic varnish and dried; the picture will present a brown-black when backed up with either a white or pink backing, and may be colored with thinned-down oil colors, so that they are of a semi-transparent character. The concave oval glass forms a complete tray in itself during the developing process.

first few attempts it will be found easy to do this so that the mark left is quite unnoticeable. A penknife should be kept for the purpose, and should be ground down on an oilstone till it is more pointed than it is at first, and the point should then be made as sharp as possible. A convenient tool for the purpose may also be made by putting a very fine cutting edge on a steel pen by means of an oilstone, and using this in the ordinary penholder. The point is inserted under the black spot, and this is almost "flicked" out of the print.

FIELD BOTANY AND THE CAMERA

By R. W. SHUFELDT, M.D.

BOTANY as a science may be divided into a number of branches or departments, the study of each and every one of which is highly important to man, and all are worthy of such study from the view-point of science for its own sake. The photographic camera and the microscope are the two most important instruments employed by the botanist in his researches, and they are now being made in nearly every quarter of the globe. With the minute structure of plants as investigated with the microscope the present article has nothing to do; it is a large subject of itself. Nor will the study of the classification of the trees, plants, and other growths constituting the vegetable kingdom be touched upon here, for this is another very large subject, as is the study of fossil plants or palaeobotany. Then we have the geographical distribution of plants, a subject fully as extensive as a number of those already enumerated, and there still remain other branches of botanical research which need not even be mentioned here.

What the photographic camera can accomplish in the field, either for the advancement of the science of botany or to aid the private researcher in that most fascinating field, is quite another question, and it is to this that this article will be in the main devoted. Apart from these ends, however, photographs of wild flowers, taken in their natural habitats, are, if secured as they should be, beautiful subjects, even when considered from the pictorial stand-point alone. When scientifically taken, this beauty is rarely destroyed, while the photographs of this character constitute substantial contributions to science, and, in a way, to art. Finally, many photographs of flowers are made in nature, which, while very interesting and truly beautiful in themselves, are, for any purpose that a botanist might put them to, utterly useless.

Before giving any practical working suggestions for the use of the photographer of wild flowers in nature, I would say that one is far more apt to succeed in this line of work if a definite object controls and inspires him in every attempt he makes to secure a good negative of the botanical subjects he selects. This, in addition to the splendid exercise the outdoor work affords, and the mental health gained through being next to nature so much of his time, will crown his efforts as a whole with success in the outcome.

Perhaps the most far-reaching object the photographer has as his aim in this line is to secure good negatives of all the flowering plants in the region in which he resides, and this would be a very worthy end to have in view. It might require the better part of a lifetime to complete such a project, and, instead of undertaking so ambitious a scheme, he could confine himself to one, two, or a few groups of wild flowers, as for example to the lily family (*Liliaceæ*), or to the violet family (*Violaceæ*), or to the roses, or to the very numerous pulse family (*Leguminosæ*), which last includes all the "pea-blossom" plants, such as the wild indigoes, the clovers, vetches, magentas, lupines, peas and beans, and many others. But have at least an *object* in your work—that's the main thing—and shun the album idea, a volume of which, only too often half-filled, is set aside at the end of a summer or two to catch the dust on some top shelf in the library.

As to an outfit, I may say that that largely depends upon the tastes and the length of the purse of the photographer. My friends have often wondered at the fact of my having secured such remarkable photographs of all sorts of living creatures, flowers, and the like with the simple outfit employed. Something like five or six hundred of my animal and plant pictures alone have been half-toned and

published, and many of them have won prizes in domestic and foreign exhibits; yet I have used the same old lens for the last forty years of my work. I have taken *everything* with it, indoors and out, all the way from a nude to a tadpole, and in every kind of light imaginable. It is a Voigtländer No. 1, which was purchased for me in Berlin, and I never expect to use any other. With it I use a simple "Triplex" shutter, which is quick enough for my class of work.

As to the camera, I have two: One is an old-fashioned "Blair Touragraph" (5 x 8) and the other 8 x 10 Anthony and Scovill. The tripod should be one of the lightest of the forms recently invented—one that will shut up into a small compass. Lightness, good extension, and rigidity are the main qualities, while the make signifies but little.

For all ordinary use I employ the Hammer plate (Red Label); and for many subjects, as yellow flowers, etc., it is best to use a slow autochromatic. Never in my life have I used any of the hand cameras, but some day I trust to be able to afford a "Graflex." My favorite developer is "Rodinal," and I employ the usual chemicals in developing, fixing, and intensifying. For the last eight years I have used only one kind of paper, that is, "Cyko" (contrast: blue label).

It is not so much the tools as it is to be able to *use them*, and use them under all conditions. It is not the gun altogether that counts in the long run; it is the man behind it.

I have often been asked why I use a 5 x 8 plate. My answer is that this is the usual size of the illustration plate in ordinary scientific magazines; and as all of my pictures are taken with the view of publishing them, I find that size most useful, economical, and satisfactory. In this matter I have never changed since 1881. As I have had no experience beyond what the above outfit has afforded me, it would be quite useless to go further into this part of our subject.

Wild flowers, as we know, grow in all sorts of places and localities. Some are

in the open meadows, others are in the dense shades of the forest, or in caves, or up the sides of steep and rocky cliffs. Again, we find them, as in the case of pond lilies, growing in the water, while in the case of some of the parasitic forms they may grow upon the limbs of trees, far above the ground. Thus it will be seen that many of them will put the photographer to the test with respect to his nerve and ingenuity. When the plant is a low-growing one, as a violet for example, the use of the tripod is out of the question; while in other cases one cannot get one's flower on the ground-glass, properly focussed, without its use, and it often requires the greatest amount of patience to employ it with advantage.

If perfect flowers and plants are what you are after, a knowledge of how to select them can only be gained through long observation and a study of the literature on the subject. People exhibit great differences in acquiring such knowledge, some acquiring *and using it* far more rapidly than others. As is the case of anything of that kind, there is no royal road to its attainment.

Now for a few special suggestions, and first in regard to the day to be selected for your field work. This will depend largely upon what your subjects are to be, for if these are in very sheltered situations, an ordinary wind will not defeat your operations; whereas, if you intend to photograph those in unprotected places, *never* choose a windy day for your work. It is simply impossible to give the necessary exposure if a breeze be eternally agitating the tender petals or leaves.

As to the light, you want all you can command when your flowers are growing in shady places; but if they be out in the full blaze of the sun, I much prefer a gray day, with not a breath of air stirring. Then you get no distracting shadows, and you can always command beautiful results by using a small stop and giving a long exposure.

Next to be considered, and what is highly important, is the point of view from which your flower is to be taken.



Often, after long experience in determining this, one can select the correct point of view almost immediately, notwithstanding the many characters which different types of flowers present. In ordinary cases, several points are to be taken into consideration; in any event, all these should be studied on the ground-glass prior to making an exposure. We have to consider the size, form, and color of the flower, its leaves and its buds, if there be any, and finally its surroundings. Some flowers are best taken *en face*, while others will only render good results, photographically as well as botanically (scientifically), when taken *en profile*. If possible, leaves must exhibit their upper surfaces, as few as possible being taken edgewise; and it makes a wonderful difference whether they have highly glossy surfaces or are dull and rough, and so on. Very shiny leaves taken in a high light will in the resulting photograph, of course, produce white surfaces and exhibit but very little detail.

Another thing to be closely studied in making such photographic exposures is the plant's surroundings. Generally, I make it a rule to photograph the plant just as I find it, disturbing nothing that falls within the limits of my ground-glass on the camera; this ensures my getting *all* that actually affected the plant's development in nature. As we know, plants are very sensitive to the light and to the objects surrounding them, especially if any of these objects chance to impinge upon any parts of them. They are also greatly influenced by the soil and degree of moisture where they grow. The photographer should bear all this in mind, and have his photographic results reflect the natural plant and

the conditions under which it grew in every instance.

Backgrounds are to be studied with the utmost care; some plants are best with a *sky* background, others with dark rock, or with foliage of some character.

Sometimes plants must be taken on slant-heights—either up hill or down—and very often we meet with those that cannot be obtained in either of these positions, as distortion of one kind or another ruins the appearance of the desired plant in the picture. The use of the tripod is often indispensable, the camera being steadied by the two front legs, while the third brings the box into the horizontal plane, with the ground-glass vertical to it. Occasionally on a slant-height the light may be so managed that a dark background can be secured without the use of artificial means. This frequently ensures brilliant results.

Vines and similar growths are best taken by selecting some part, the most of which lies in the vertical plane, then using a very small stop, and giving a long exposure on a gray day. We are pretty sure to get something worth the while.

Some flowers, especially those that appeal to everybody, often make beautiful pictures when taken *en masse*. A field of our common daisies is a good subject.

Where the background cannot be gotten rid of, some photographers of wild flowers resort to the use of a black cloth background. This rarely appeals to me, and I only mention it here in order to make my contribution as complete as possible. To me, nature wins over artifice every time, though there are cases where we have to resort to the latter, especially where marked distinctness is demanded.



PRACTICAL PAPERS ON STUDIO WORK AND METHODS

The Assistant, Par Excellence, and What Makes Him

Two things are absolutely essential to every successful assistant—common sense and self-respect; and without these no assistant will ever rise to any great height. Everyone possesses them in some measure, and for the rest they must be cultivated.

One thing I would like to lay emphasis upon, and that is that you cannot expect your employer to look after your interests instead of yourself. If he does take an interest in you, so much the better; but you have got to either rise or fall by your own personal efforts, and this, I think, is what so many assistants forget. The employer has his own affairs to look after, and you must look to your own business yourself.

It is your business to make yourself thoroughly competent and efficient, and these are the qualities which will ensure you a good salary, and the standard of efficiency which you have to aim at is not your own, but the employer's, for he it is who pays the salary.

There is one great faculty that spells success in all businesses alike, whether it be a linen-draper's or a decorator's, and that is the power of concentration. It does not matter what task you are engaged upon, empty your mind of everything but that, give that task your whole individual mind, concentrate every thought upon it, and you will do that thing well.

More than that, you will be able to do it well always, and whatever you may take up, if you will make this a habit and always give your mind to it, to one thing at a time, and do your level best at it, that will make you thoroughly proficient.

This habit of giving one's mind to one's work is a gift possessed by few people, the rest of us have to cultivate it, to force ourselves to do our best always, and not to scamp or shirk. The assistant who can be trusted not to scamp can be left to work alone, and this is just what the employer requires, and not to feel that the minute his back is turned—well—things may go

right, though it is more likely that they will go wrong.

We each one have to buy our own experience; no one else's is of very much use to us, and in all probability we shall have to put up with a few unpleasant experiences in getting it. Still, because we chance to get into a nigger-driver's clutches is no reason why we should abuse all employers; there's only just one thing to do, and that is leave and try a fresh place, and it is in making these changes that one acquires experience. If you are not comfortable, why, don't waste your breath abusing everybody, but just put your shoulder to the wheel and try, try again.

I suppose that, if questioned, every assistant now in a good berth could tell of some disagreeable experience, but these things have to be swallowed like a dose of evil-tasting medicine, which ultimately will do good.

I referred to common sense, and that is the foundation-stone of all good work, and it is *only* good work that deserves good money. Common sense teaches us to think; and work thoughtfully done is the best work. One of the most frequently uttered excuses for blunders is "I didn't think." But why didn't you? It doesn't mean that you have to be a genius in order to use ordinary everyday common sense, yet common sense is the greatest money-maker in the market.

I imagine that you are in the photographic business because you wanted to be, and that you didn't get there by chance. That being so, you ought to be contented. I don't mean you ought to be a stick-in-the-mud, but that you ought to be fond of your work.

Whether work is monotonous or not usually depends on two things—do you care for it, and whether you are a good workman. If you are not fond of your work you had better make a change, and make it quickly; but the better you can do your work the better you will like it. If you are feeling dissatisfied, just try and do the best bit of work you ever did in your life, and you will at once lose a lot of that feeling,

and the harder you work the quicker you will lose it altogether.

The better you do your work the more full of interest you will find it, and this will call forth all the best abilities that are in you. Work is a fascinating thing, and it is like a perpetual boxing contest, in which all your skill and powers are in constant use to overcome difficulties, and it is just this that gives it its charm.

Granting, then, that you are fond of your work, which is the first essential to success, what are some of the other qualities needed? Tact is a quality often advertised for, but what is it, after all, but common sense used like oil to smoothe the running of daily life. And why, then, should it be so rare? Why not try to cultivate it?

Thoroughness and skill go together, and are the outcome of giving one's mind to one's work, and surely work is not worth doing at all if it is not worth doing well; so then, give your mind to it and work thoughtfully and well.

Quickness, again, is a thing that can only be acquired, as a rule, by making a determined effort to work quickly *as well as* accurately, but the power to do so once acquired will be a life-long blessing, and will well repay your efforts.

Good taste, refinement, and an artistic eye are all things that may be acquired by study and observation of good work, and with so many good illustrated magazines about it is no use saying that one does not get the chance to see good work, for there are few places nowadays that do not boast a reading-room at least. I believe it is the spirit of grudging one's spare time for a little extra study or work that keeps so many assistants down to a dead level. I feel sure that one has to pay for success, if not in money, then in time, and if you do not allow time for study, then you pay for it dearly with a small salary. Good salaries have to be worked for, and though some managers, etc., seem to get a big salary for little work, yet you may be sure that at some time they have had to work, and hard, in order to acquire the necessary experience to qualify them for such a post, and you also will have to do the same. And the younger the man who gets such a post, the more hours of thought and study, you may depend, he has had to put in. I feel confident that employers, managers, and assistants in good posts will bear me out in this.

Always remember that nothing is really got without working for it, though it is not the man in the dirtiest apron who always does most work.

If you want a good salary you have got to *know*, even if you have no occasion to know. There may, and probably will, come a time quite without warning, when you will have to put this bit of extra knowledge to use, and woe betide you if you do not know.

Knowledge, I believe, is usually paid for at a higher rate than work, so that if you are shut up with a firm who will give you no chance to either learn or prove what you do know, why, the only thing is to clear out.

Many quite good assistants keep themselves out of the class of business they want to get into just because they do not give enough thought and care to the form of application they make. Any descent employer will respect you the more

for asking sensible questions about hours, class of work, and even prices charged, for this is oftentimes the best real guide to a stranger as to the sort of work he will have to tackle, and in return he expects *honest*, sensible information about your qualifications. I firmly believe many a good berth is lost just through this; and if you want to get into a good class business, what on earth is the good of answering advertisements that obviously come from cheap class business? Yet it is done every day, and then the applicant uses words about the things and hours asked of him in return for an absurd salary.

In the very beginning I mentioned self-respect, and it is chiefly at this juncture that it steps in. It is a thing that has to be preserved at all costs, if you want a decent salary and respect from others. Many of the men with such good abilities who work for such low salaries are those who have let some bad habit master them—drinking, gambling, or dishonesty, and thus they are simply *forced* to work for next to nothing or else starve; though, at the same time, they do an immense amount of harm to others who have to follow on. But they, alas, find that it is so easy to slide down, but so hard to climb up again, and so they become the hack workers. Had they but preserved their self-respect this would not have happened. You may not like or be liked by those you have to work with, but that is no reason why they should not respect you.

Personally I do not believe that there are very many employers who really stand in the way of an assistant's learning and getting on, for what on earth have they to gain by it? But, alas! there is a lot of this sort of thing done by one's fellow assistants, purely through jealousy. Before you blame your employer, have a talk with him, and make sure whether or no he is really the cause of your having to take a back seat. You ought to know, but, anyway, make sure, and do him justice.

Some assistants are most frightfully jealous of one another, and great tact and patience are required in order to work with them. These are the sort of assistants who will take great pains to hinder one from learning even the smallest detail of *how* they work, but when it comes to a pinch they usually find that there is no one ready to enlighten them, for they make themselves so disliked. This surely is a very wrong and foolish attitude, for even the best of photographers have to go on learning, all their lives through, and it is chiefly from one another that we do learn, a bit here and a wrinkle there; it is purely a matter of give and take.

To be a good assistant, again, one needs a sound idea of modern commercial methods of doing business, keeping books, filing letters, and a hundred and one other little matters.

It may sound a great deal, but in reality everything one learns makes it easier for one to learn something else, and so to keep thoroughly up-to-date and abreast of the times.

Train yourself to remember things (for it *can* be done); be systematic and careful, and cultivate all your powers of observation, get into the habit of noticing even tiny things, in other people, and it will be a great help to you.

This may sound like quite a catalogue of virtues, and at first the exercise of some of them may prove a little difficult, but gradually most of them will become quite fixed and unconscious habits, and the result in practice will make you a first-class assistant. Remember that there is always room at the top, while the higher you rise in your profession and the better the work you do the better the treatment you will receive, for among the really good class firms they usually know the right value to set upon a good assistant, and also the treatment to mete out to him.—G. E. H. G., in *British Journal of Photography*.

Keeping up to Standard

WE once read of a photographer who procured the finest possible prints by each of the processes worked in his establishment and hung them in his workroom as a standard for his printers to reach and, if possible, to improve upon. The idea was a good one, but it should not be confined to the workpeople only, the principal himself should have a standard visible or ideal in all his work and endeavor to live up to it. Let us take a few instances in which this may be done with profit in a material as well as in a moral sense.

Firstly, we have the very important point of permanency in prints, which is now, to use no harder term, being overlooked by many workers. Only a few years ago when albumen and P. O. P. were in possession of the field, photographers doing a high-class business made a strong stand in favor of processes of undoubted permanency such as carbon and black platinotype, and obtained good prices and also a well-merited reputation by so doing; but to-day many have practically discarded these, and are relying upon one or other of the development papers, which, excellent as they are, cannot be guaranteed against fading for even a few years. Is it not worth while to go back to the old standard, and instead of making a toned bromide enlargement to make one which is of known durability and to impress the fact upon the customer? He will part with his money more cheerfully if he is assured that his father's portrait will pass on to his own children's children without loss of quality.

Another standard which has to be maintained is the actual quality of the print, and here there is real danger of deterioration creeping in by almost imperceptible degrees, especially with bromide and gaslight papers. These we know will work wonders when used with poor negatives, and there is always a temptation to go just a little too far and to put into the printing frame negatives which should have found a resting place under the sink. The expression and pose may be good and the sitter may be satisfied, but the print may fall into the hands of people who do not recognize this, only seeing the poor quality of the print, and the inference they will draw is that all that photographer's prints are of the same quality, and consequently their patronage is bestowed elsewhere. Even from good negatives it is easy to produce poor prints by giving incorrect exposures or by using worn-out developer, and in the latter case the worst

of it is that the change comes on so slowly that it is apt to pass unnoticed, unless there are some standard prints with which to compare from time to time. It is generally unwise to take a standard from among one's own work, unless the photographer can look round the photographic exhibitions and into the show windows of the most successful photographers in our great cities, and say truthfully that there is not a print shown which he cannot equal. In that case he is to be envied or perhaps pitied, for he may feel that there are no more worlds to conquer. There are, however, few on this plane, and those we should expect to find upon it are always ready to acknowledge that they occasionally come upon a picture which they would be proud to have produced. Remember, too, to take the big man's best work as the standard, and do not compare your best print with his worst and then argue that all your work is as good as his.

A standard should be set for punctuality, which seems such a commonplace virtue that it is below the notice of most photographers. If proofs are promised in three days, let them be delivered to time, and if it be not possible to deliver the whole of an order by the time agreed upon, let as many prints as possible be sent, with an apology. Do not wait until the entire number can be delivered, as this causes a feeling of annoyance and does not tend to an appreciative reception of the work when it does come to hand. One point in which many photographers fail is in allowing a gradual deterioration in the appearance of their premises inside and out. In taking fresh premises they should be careful to see that paint, metal work, blinds, and drapery are bright and fresh looking; but few are careful to maintain them so, and now that competition is so keen, and that family trade can no longer be relied on to keep a business going, appearances must be kept up to a fairly high level to attract fresh customers. It is the old-established man who is likely to suffer most in this way, for he gets into a jog-trot "good enough" style, and then cannot understand why his young rival, who is full of hope and enthusiasm, manages successfully to poach upon what he has considered his own special territory.—*British Journal of Photography*.

Properties

MANY a time it happens that the photographer gets a sitter—often a child, sometimes an elderly person—and directly he sees them his mind conjures up a mental picture of the splendid specimen that he or she would make. In a flash, as it were, all the details settle themselves in his mind, he can see just how to do it to produce the result he wants. But, alas, almost as surely as this happens, so surely is the dress and clothing of the sitter utterly unsuitable. We all know just how hard it is to secure those rare yet delightful specimens that, hanging in reception-room or studio, are such an excellent advertisement. Surely it would be worth taking some little pains and trouble to make it an easier and less rare occurrence to get such negatives. Many and many an operator envies those specimens he sees hanging in another man's window, and says, "Oh well, but just look at the

sitters he gets, I could get just as jolly negatives if only I had sitters dressed like that," and there the matter rests.

The artist gets just the same trouble, but usually he does *not* leave it there, but takes pains to overcome the trouble, and so grapples with it successfully, as we may see at any exhibition of paintings. He does this by providing himself with a few suitable "properties."

Take the case of children, you get a little chap who would make a delightful barefooted study, but alas, he is got-up in some prim serge sailor suit or kilt or something equally hideous. All right from his mother's point of view, of course, but all wrong from the operator's.

Now, if you kept at hand one or two ordinary holland "smocks" of real smock style, it would be only the work of a minute or two to slip off boots and stockings, and put him into one of these comfortable, quaint, overalls, which hide so great a multitude of sins of ugliness, and immediately you transform him into a "study" ripe for your lens. Rumples up his hair, give him suitable toys and background, and you have your heart's desire, and inasmuch as it does not mean undressing him mamma will not object. Two sizes of smock are best, one smaller and one bigger; as they are loose, overall garments a little extra size will not hurt, and will make it more really useful.

A couple of large dark silk handkerchiefs—upon one of which your receptionist can sew a number of little showy sequins—together with a beribboned tambourine—will give you lots of charming head and shoulder studies of dusky little gipsy lassies, whom your eye judges suitable. One handkerchief (with the sequins) goes three-corner fashion over the head, and the other folded the same way, over the shoulders, which need to be bare, and there you have excellent material to work upon.

An old dark shawl, a wide brimmed soft and also old felt hat and a few clay pipes of different lengths and shapes will help to transform many a prim sitter into a splendid study of the kind you need. While for elderly gentlemen, with the right type of hair and face, a dark skull cap, and an old dressing gown will work wonders, hiding the excellent work of the most fashionable tailor. Mind you, it's highly probable that these sitters will not order from such negatives, but the striking and interest-arousing specimens they make are amply worth the trouble, and no mother is proof against a charming child study.

A pair of children's size wooden shoes, which can be procured from any of the theatrical supply depots, are also a most useful thing, and give just the right finishing touch to many a quaint little child study that otherwise is tame and ordinary. A biggish size can be used, as they do not look by any means out of place. A nice old wooden bowl for blowing bubbles, with one or two long clay "churchwardens," will also be extremely useful for children, and help to make interesting pictures.

Two very handy little things to use with older men folk, are the quaint, often ugly, old tobacco jars, often with hideous human faces; and also the old "toby" jugs. Excellent modern copies of both these articles can be bought for a quarter

or so, and there is no doubt that often these little details give the right finishing touch to a "character study."

Of course, useful though all these things are, everything must necessarily depend upon "the man behind the camera," not the least part of his tact will be needed to induce the right sort of sitter to submit to such a metamorphosis, but the results will repay his trouble and persuasiveness, and lead to more business by keeping his windows bright and attractive.

At any rate, in our search for good specimens let us not forget to take a leaf out of the artist's book and provide the necessary "properties" to ensure them, instead of the few meagre yards of chiffon for draping, which seems to be the sole stock-in-trade of many of the photographers who grumble most at their lack of those artistic specimens which many of their brethren display. Hercules told the carter to put his shoulder to the wheel, so let the grumbler keep a few useful and artistic "properties," and not forget to use them.—G. E. H. G., in *British Journal of Photography*.

Photographers' Advertising

I WANT to speak of means for getting people to inspect one's work. In regard to these methods, I am assuming that the business is of such a fairly high-class character that it will repay one's time and trouble which are spent in inviting the better-class people in the locality to look at one's portraiture. I am not thinking now of a cheap class of business, the customers of which are drawn from the masses of the population which, I think, it would be profitless to circularize in respect to any of the schemes which I am now referring to.

Of the various ways of inducing people to examine one's work attentively, I hold the view that the most effective, where circumstances permit, is to issue an invitation to some collection of photographs arranged in the reception-room or studio. To me that has always seemed the most adroit form of advertisement, because it smacks less than any other of the professional advertiser. The thing is that one should have a collection of photographs which will provide the inducement to come. In my experience, one of the surest draws has been photographs of children, but, then, I have always gone to a good deal of trouble to "put on" the exhibition in proper shape. To do this, it is necessary, I think, to have a small catalogue with entries corresponding with the numbers on the portraits and either indicating the identity of the little sitters or providing some fancy title. In giving the names of the children, one must, of course, get the permission of the parents, as, indeed, is equally necessary for the exhibition of the photograph at all. When it comes to deciding the form in which the name of the child shall be entered in the catalogue, some little difficulty presents itself. The usual plan, of course, is, for example, "Gladys, daughter of A. B. So-and-so, Esq.," which is all very well on the principle that no man is offended by being addressed as "Esq." It breaks down, however,

for the reason that some men object to others being so addressed, or, rather, the objection comes from the wives of those considering themselves to occupy the seats of the mighty. One seeks to avoid treading on people's corns, and, therefore, the best way out of the difficulty is simply to use the Christian and second names of quite small children, with the prefix of "Miss" or "Master," if they are anything more than little toddlers.

I would leave the reader to his own exercises in psychology for the purpose of selecting special collections of photographs which will best serve for little exhibitions like these. He may be reminded of the redoubtable Mr. Strauss, of St. Louis, who has made his establishment a social center of the city by such means as these. I believe one of Strauss' most successful exhibitions in his studio was one of the eligible bachelors of St. Louis.

I can give one hint on what to avoid, and that is local municipal personages. I once thought that a collection of portraits of the mayors past and present would have proved some sort of an attraction. I must have been mad. It turned out that hardly anyone wanted to see the photographs of mayors, and by the time I had got the pictures ready for the walls I wasn't surprised at it. No reason, by the way, why one's facilities for holding a little show should be restricted to photographs. I heard not long ago of a brother professional who used his reception-room for a week or two in showing the work of a local landscape painter. He said that it brought people to his studio who would never have come there by any direct inducement.

Another scheme which has its scope is the provision of the opportunity for possible customers to inspect your work at home at their leisure. It is not a scheme which can be worked in a big way, but as a supplement to other means it is certainly one which is worth while. One advantage of it is that the particular photographs to be offered for the consideration of, say, Mrs. A. can be selected with regard to any knowledge one may have of the social circle in which Mrs. A. moves, or would like to move. There is something in that (more in one case than in another), and I tell my receptionist to use her knowledge of people when selecting the portraits for a portfolio. A very essential thing is to avoid giving people any trouble in looking at one of these portfolios and in fixing it up again in readiness for its being called for. The portfolio should be of substantial material—some of the linen-surface mounting papers make a good covering for the heavy boards of the body of the portfolio. There should be broad silk strings which can be easily untied and retied, and it is best, I think, to send the portfolio without any outside wrapping, but simply with a brief letter expressing the hope that the contents will be deemed worthy of inspection, and intimating that a messenger will call for the portfolio within, say, three days. Odd times provide the means of making and mounting prints for these portfolios, some half-dozen of which, each containing, say, a dozen prints, are amply sufficient in a town of moderate size. A register must be kept of the names and addresses to which a portfolio is sent, and it is a good rule,

I think, not to repeat an application of this sort within two years.

Now I come to what is perhaps the most widely used method of canvassing for business—namely, by booklet, which makes some appeal to the intending customer and is accompanied by a selection of reproductions of the photographer's work. Undoubtedly this is an excellent scheme of approaching a larger circle of possible customers than can be reached in almost any other way. The first condition for its success is, I think, that the reproduction should be as good as can be made. Hitherto, the sole means of issuing such reproductions has been the half-tone process, and I have seen some exceedingly beautiful specimen books of photographers' work in which everything had been done by way of choice of ink and paper to convey an adequate idea of the quality of the actual portrait prints. On the other hand, I have seen many examples which have seemed to me totally useless for their purpose—a poor sort of block, not as well printed as it might be, on inferior paper. It must be recognized that in any process of reproduction the quality of the original photograph is lost to a greater or less extent. With the highest class of half-tone engraving, and when using a high quality toned paper of velvet surface, one can certainly secure an effect which does not reflect unfavorably upon one's work. An even better degree of reproduction is obtained by the photogravure process, for the proofs from these intaglio plates have a quality which is altogether missing from any half-tone work. Now that there are a number of firms turning out excellent machine photogravure, it may be anticipated that professional photographers will find the process a valuable one in bringing their portraiture adequately before the people in their locality by postal distribution.

A booklet of this sort gains greatly in effectiveness if the brief letterpress contained in it can be made apropos of something taking place in the district, or, at any rate, if it can be issued with some definite appeal such as photographs for Christmas presents, a regular series of portraits of children, or a similar text of having a general application. When the engraver and printer have done their best it still remains for the photographer to do his part in the best way. Extreme care should be given to having the names and initials of each person to whom the booklet is sent exactly right: mistakes of this kind immediately give a suggestion of slovenliness in the minds of the people before whom they come. It is a matter for consideration whether the envelope should be sealed, or the booklets sent in envelopes with a half-penny stamp. If a booklet is thoroughly well done, it is often worth while, I think, to spend a penny on its postage in a sealed envelope for the sake of making sure that it will get into the hands of the recipient and not be thrown away with other "circulars." One requires to consider, too, the time of year at which to issue such a booklet. Usually, spring and autumn are the best times of year, although in the country some special local event, such as a horse show, big cricket match, or ball may provide an occasion of new clothes with their consequent inducement for fresh photographs.—*British Journal of Photography.*



Prizes for Pictures

FOURTEEN prizes aggregating \$3000 cash, and ranging from \$100 to \$750, are offered in the 1917 Kodak Advertising Competition for pictures suitable for illustrating kodak advertising.

Type talks, but in comparison with a picture it takes it a long time to tell the story. For this reason there is particular point to the photograph on the advertising page, where space means money and where the one idea is first to get the reader's attention and then to tell him something so emphatically that he won't forget it.

For years much of the impetus of this advertising drive has been supplied by story-telling photographs—not necessarily pictures made with a kodak, but pictures that put the joys of kodaking or the distinctive features of the kodak right before the reader's eyes. These pictures have helped sell kodaks, and most of them have been secured through annual competition.

There is big money and a growing market for photographs that will sell goods. The field is one with which any photographer can well afford to acquaint himself. The 1917 Kodak Advertising Competition offers the opportunity, the experience will prove invaluable and the prizes supply incentive. A detailed circular will be supplied by applying to the Eastman Kodak Company, Rochester, N. Y.

Enlarging: A Few Suggestions for the Professional Photographer

A NEW and revised edition of this valuable and suggestive handbook has just been issued, and we are glad to bring it to the attention of our readers. Every phase of this profitable and popular method of photography is treated upon with many notes and illustrations, and can be had by applying to the Eastman Kodak Company, of Rochester, N. Y., or through your dealer. We recommend it for the soundness of the information and the many helpful suggestions.

Our Cover Picture

OUR attractive cover picture, "Daisies," is by Mr. J. I. Saad, of Pikeville, Kentucky, a
(264)

photographer whose work is distinctive and of a very high order, and is gaining recognition wherever exhibited. We expect to have the pleasure of showing our readers further examples of Mr. Saad's work in the near future.

The Summer Session of the Clarence H. White School

THE eighth summer session will be held at Canaan, Connecticut, during July and August, 1917, the growth of the school having necessitated a change from the former location. Canaan is situated in a beautiful valley in the Berkshire Hills of northern Connecticut, and is about four hours' ride by train from New York City. Canaan is at an elevation of about eight hundred feet above sea-level, and is surrounded by hills rising eight hundred feet or more above the floor of the valley. The country furnishes abundance of photographic material, comprising, within easy walking distance of the school, farms, rolling uplands, streams, rugged mountains, and architecture of typically New England character, many of the buildings dating from Colonial times.

Sessions of the school are held in a commodious and neatly finished building, equipped with dark-room, lecture and exhibition room, studio, enlarging room, a printing and work room, running water and electric lights, and the whole affords ample opportunity for full instruction in both the artistic and the technical phases of photography.

The efforts of the faculty are directed toward familiarizing the student with the construction and use of the camera, with the types of lenses and their applications, with exposure and development, and with the various printing mediums of value to the artist. As much time and effort as are given to the study of technical methods are devoted to training the perceptions of the photographer and to cultivating in him a mental attitude which will make his work of lasting value from an artistic point of view. Some of the students of former years are now among the most favorably known exhibitors of this country and Europe, and some are successfully engaged in teaching and practising the art of photography. The lectures on art appreciation will be illustrated with carefully

chosen lantern-slide reproductions of art and art-photography.

Students in the summer school will be credited on the full-year course with the work done in the summer term.

Applications for accommodations should be made to Mr. White or direct to Miss Louise Bragg, The Maples, Canaan, Conn., at the earliest possible moment.

For reservations or further information, address: Clarence H. White, 230 East 11th Street, New York City.

The New "Universal" Catalogue

FROM Messrs. Burke & James, Inc., of Chicago, we have received a copy of the latest edition of the "Universal" catalogue. Since taking over the agency for this camera we learn the sales have been unusual. The "Universal" at \$300 represents a wonderful value at the price now obtainable in the motion-picture field. It is an especially desirable machine for motion-picture weekly men, advertising and commercial film producers, newspaper photographers, and well-to-do amateurs. A copy of this new catalogue will be mailed to any of our readers on request.

This well-known firm also have an excellent proposition for photographic supply dealers and motion-picture supply houses.

The Finger-print Camera

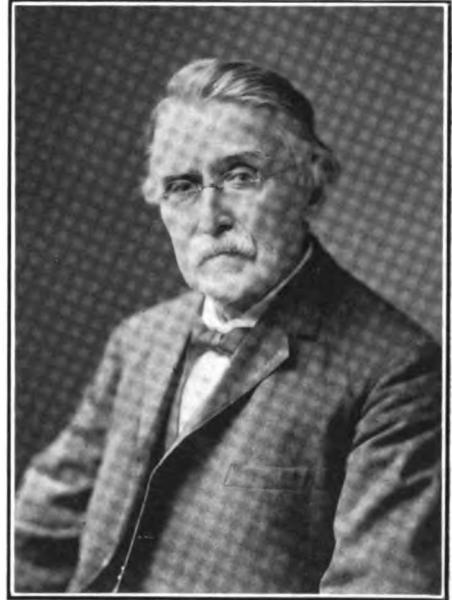
FROM the Folmer & Schwing Division of the Eastman Kodak Co. we have received a booklet describing the new Finger-print Camera, which that ingenious camera deviser, Folmer, has invented. This camera is primarily intended for use in criminal investigations, based upon the well-known fact that finger-prints are nearly always left behind by the criminal in action and that no two finger-prints are alike. The camera is also recommended for use in obtaining full-size records of lace patterns, labels, printed or written matter, etc. In fact, its use is unlimited. The camera is equipped with four miniature lamps operated by batteries placed in the camera. When the camera is in use, placed directly against or over the subject or finger-print to be recorded, these lamps are automatically turned on by pressing the shutter release lever, making the exposures. An F/6.3 Kodak Anastigmat lens is provided and either plates, film-packs, or roll-film can be used. The price of the camera complete is \$30. The camera will undoubtedly have a big sale both in police departments and in all lines of business. The booklet describing the camera and its use can be obtained free on application to the Folmer & Schwing Division, Rochester, N. Y.

Eastman Plans Paper Mill

THE Eastman Kodak Company has the foundation laid for a photographic paper mill, 128 x 430 feet, six stories and basement. This building will be of concrete and steel construction, and the largest mill of the kind in the world.

Death of Frederick Gutekunst

FREDERICK GUTEKUNST, dean of American photographers and a world-wide celebrity, whose remarkable pictures of great men of this country were noted everywhere, died at his home in Philadelphia, April 27, at the age of eighty-five years.



THE LATE FREDERICK GUTEKUNST

Born in Germany in 1831, the son of a cabinet-maker, Mr. Gutekunst came with his father to this country when a boy, and settled in Germantown. After receiving a common-school education he entered the employment of a druggist and while there experimented in chemistry and electricity. In those days daguerreotypes were regarded as great curiosities, and he experimented with them, finally making copper electrotypes from them. His work in this direction brought him in contact with Dr. Isaac Norris, afterward secretary of the Franklin Institute, who had been making experiments with daguerreotypes, and they exchanged apparatus and from that time began his career as a photographer. He secured a gallery in Arch Street, Philadelphia, in 1854 and for more than sixty years personally conducted his establishment.

The business grew apace, especially after the Civil War broke out, for every soldier had to have his picture taken, as did all his relatives and close friends. From the beginning almost to the day of his death Mr. Gutekunst had taken great pride in his profession, and personally supervised all the work of his studio, from the taking of the negatives to the printing, mounting, and finishing processes. Because of his love of his profession, he was ambitious to make photo-

graphs of men eminent in their professions, and his collection of negatives of distinguished characters is unequalled. The number of national celebrities whose pictures he took—some nearly life-size—is legion. Among the really great pictures are those of William McKinley, Grover Cleveland, Carl Schurz, William Cullen Bryant, Henry Wadsworth Longfellow, and others too numerous to mention, and all extraordinary specimens of the photographer's art, and it is safe to say that they are unrivalled, not only in this, but any country. Mr. Gutekunst bestowed the most loving care on every detail that went to the perfection of his establishment, and was entirely free from mercenary considerations in the practice of his art. He loved his work, and was so conscientious in his prints that, even when the sitters were satisfied and he was not, he insisted upon new sittings.

It will be interesting to our readers to know that prior to the beginning of this *MAGAZINE*, its founder, Edward L. Wilson, was associated with Mr. Gutekunst and for years they enjoyed the closest friendship.

How to Regain Gold, Silver and Platinum from Waste Solutions and How to Sell it

FOR the benefit of our readers we publish the following directions to regain gold, silver, and platinum from waste solutions, and by writing to the address at the foot of this item you can find a market for the regained metal.

1. Add enough acid (muriatic or sulphuric) to make it sour (about one pound to the gallon) and stir well.

2. Then dissolve the sulphuret potassium in water (about one pound to the gallon), and add this to the sour waste solution. Stir well and allow it to settle for about three to five hours.

3. Collect the precipitate on a muslin filter. It may then be shipped in a tight package direct to the refinery at Newark, N. J.

It is to your advantage to keep platinum separate from gold and silver.

Write to Charles Cooper & Co., 194 Worth Street, New York, N. Y.

"Landscape Photography"

THIS latest number (160) in the excellent *Photo-Miniature* series presents an intimate guide for those who want to make pictures with the camera out-of-doors instead of mere photographs. This issue is profusely illustrated and is a complete and satisfactory handbook on this seasonable subject. Copies at twenty-five cents can be supplied through your dealer or from the publishers, Messrs. Tennant & Ward, 103 Park Avenue, New York City.

Coming Conventions

Missouri Valley Association. To be held at Kansas City, July 17 to 21.

Ohio-Michigan Association. To be held at Cedar Point, July 31 to August 3.

Photographers' Association of America. To be held at Milwaukee, Wis., September 3 to 8.

New England Association. To be held at Providence, R. I., September 25 to 28.

Texas Association. Houston, Texas, September 17 to 20.

The Cirkut Method

THIS is the title of the 1917 Cirkut catalogue. The Cirkut has long ago found its place in the well-equipped studio, as the demand for its services is unending. Quite aside from its use for group photographs at both large and small gatherings, conventions, etc., the professional will find it very valuable for making panoramic pictures of his locality. There should be a large demand, too, this year, if this country takes to preparedness, for Cirkut pictures of local companies of the militia. The new booklet illustrates a couple of such soldier groups. The Cirkut comes in six sizes of film width, 5, 6½, 8, 10, 12 and 16 inches, the length of the picture possible with these varying from 42 inches for the smallest to 20 feet for the No. 16. The booklet will be sent free on application to the Folmer & Schwing Division, Rochester, N. Y.

Stellar Images on a Photographic Plate as Affected by Development¹

A PRELIMINARY investigation of a twofold nature: (a) determination of differences in power, if any, of various developers in developing faint stellar images; (b) determination of differences in quality, if any, of stellar images, depending upon the developer, with special reference to the accuracy of measurement of their distance apart on the plate.

The tests were made by photographing a series of small round holes in a plate. Under (a) above, no certain differences were detected. In investigating (b) pyro and caustic hydroquinon (process developer) were tried, development being carried to two and four minutes. From the measurement of 320 distances between images it was established that greater accuracy in measurement was secured where the process developer was used; that the lighter development gave best results. This superiority was anticipated, since the appearance of the images was decidedly better for short development in process developer than for any other of those tried.

¹Communication No. 47 of the Research Laboratory of the Eastman Kodak Company, published in *Journal, Optical Society of America*, January, 1917.



CORRESPONDENCE

Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names & addresses of the writers are given. We do not undertake responsibility for the opinions expressed by our correspondents.



WORTH-WHILE LETTERS ON LIVE IDEAS FROM OUR CONTRIBUTING EDITORS

Keeping Fingers Clean

TO THE EDITOR:

SIR: In reply to your recent letter, I give a hint for keeping the fingers in better condition.

Heat paraffin in pan until melted and add equal amount petroleum jelly (cosmoline); when all is melted, pour into tin boxes (typewriter ribbon boxes are good).

For use, apply to finger-tips; if in cold weather, work up in palm of hand.

This protects from silver stains, considerably; but, say once or twice a week, apply saturated solution sulphuret sodium (old solution is best), to be applied with absorbent cotton on end of stick to silver stains and will turn the old skin and stains black.

While applying be careful not to over do. Apply for few seconds, then rinse under tap; old skin can be removed with finger-nail, blunt knife, or scrub-brush.

Any old skin not removed by above methods can be finished up with solution of iodine and cyanide, as used by photo-engravers.

The iodine solution is: iodine, $1\frac{1}{4}$ ounces or parts; iodide of potassium, 3 ounces or parts. Take small quantity and add enough cyanide to turn clear. Apply with cotton and rinse well. As the cyanide is poisonous, do not apply to broken skin or cuts. Probably by experiment you could improve on these methods, especially in regards to cyanide.

The cyanide is not absolutely necessary, but makes a better finish.

I find when removing chemical stains with sulphuret sodium instead of finishing up with the iodine and cyanide I now use a wad of absorbent cotton, wet, dipped in powdered pumice-stone as a finish, being non-poisonous. You can the better recommend or publish same.

OTTO E. ELWERT.

APRIL 16, 1917.

A "Touching-out" Method

TO THE EDITOR:

SIR: For "touching-out" plain photographic work, I advise you to have by your side a palette, upon which are ground moderate portions of a good black Indian ink, warm sepia, and scarlet lake. With combinations of these you can readily imitate the photography upon which you are working, whether it be cold or warm in tone. Of course, it is necessary to apply these tints with a brush, and if you use plain water as a diluent, you will leave a dead

surface that betrays your trail. Everyone will exclaim: Why not then use gum water? That will leave a gloss. Perfectly right! but it leaves too much gloss. In addition, I don't believe that the half of you know how to make gum water. Accept my formula, and adopt it or not, as you see fit:

Picked gum Arabic	1 oz.
Loaf sugar	1 dram
Acetic acid	39 min.
Alcohol	30 min.

Water in sufficient quantity, say, from 6 to 8 ounces.

Don't be frightened at the mention of the acid, and at the idea of putting a modicum of it upon the surface of your photograph. Used in this way, it will not, I assure you, prove destructive in the slightest degree. The gum water, however, I do not use for the indicated purpose. There is a better vehicle—the much-abused, always useful, *albumen*.

The value of an encaustic paste in giving depth, richness, and transparency to the shadows of a photograph, and in bringing out the delicate gradations in the whites, is now so well known that it needs scarcely to be stated; and it is tolerably clear, also, that it adds to the permanency of the prints. My prints owe much of richness and depth to treatment with an excellent preparation of this kind, the formula of which stands as follows:

Pure virgin wax	500 gms.
Gum elemi	10 "
Benzole	200 "
Essence of lavender	300 "
Oil of spike	15 "

Those who wish to try a small sample can substitute grains for grams. Melt the whole on a water-bath, mix thoroughly, and strain through muslin. A simpler plan will be to dissolve the elemi in the solvents, as described above, and, after filtering, mix with the melted wax, as the filtration, which is chiefly intended for the gum elemi, is more easily managed before the wax is present. This, when finished, forms a stiff paste. By increasing the proportion of essence of lavender it can be made thinner, which in winter may be desirable. The encaustic paste is put on the print in patches in three or four parts, and then rubbed, with a light quick motion, with a piece of clean flannel, until a firm, fine surface is obtained.

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If a rich, thick coating of the encaustic be desired, a very light pressure in rubbing is necessary, so that a polish may be acquired without rubbing off the paste in the operation. If a print be retouched more special care is required to use a light hand in applying the encaustic paste.

Yours truly,
SOL HELLER.

April 23, 1917.

Printing Stereoscopic Negatives

TO THE EDITOR:

SIR: I send you a little dodge in the printing line which I find useful in making prints from stereoscopic negatives, and by which cutting and transposing either the prints or the negatives are saved. In the first place I have a bottom line on my negative, which can be made by pasting a narrow strip of paper or drawing a clear line with a sharp knife on the base of the negative, and which serves as a guide for cutting away the edge of the print. Next cut your paper in strips, suiting the *width* of your negative and just *twice* its length. Have a piece of smooth, thin, opaque paper just the exact length of the negative; draw a vertical line on this in the center; lay your paper, albumenized side out, on this mask, making the ends to meet at the line; now print first on one side and then on the other, taking care to have the base-lines correspond; and when the print is made, cut the paper in the center, and it is already matched, transposed, and ready to have the corners trimmed either round or square, and mounted

A. P. LIBBY.

May 4, 1917.

Retouching

TO THE EDITOR:

SIR: I think the practice of retouching the negative a sad thing for photography. It is impossible, for even very capable artists, to rival or improve the delicate, almost mysterious, gradations of the photograph. Magnify the photographic rendering of, say, the human eye, with a strong lens, and it is found to be almost startling in its marvelous truth. Magnify the retouched image, and it will look like coarse deformity. It ceases to be true. I have sometimes seen a touched photograph which looked very nice, but it possessed no interest for me; I knew it could not be trusted. I have been charged with sophisticating photographs because I combined and masked and sunned prints. But there is a great distinction between suppressing and adding; I never added. I stopped out portions of the negative which

I did not require to form my picture; I sunned down that which was obtrusive, and where one negative would not serve, I used two or more, joining them with as much truth as I could. But I never attempted to improve negatives. I never believed that I could draw better or more truly than nature. I consider a touched photograph spoiled for every purpose.

O. G. RELANDER.

April 26, 1917.

Manipulation Pointer

TO THE EDITOR:

SIR: This may be of help to your readers. I find the cold affects the chemicals by rendering them torpid, whereby they lose one-half of their power and energy. The collodion sets slowly, and the resulting plate, instead of coming out of the bath rich and creamy, will be thin and transparent, of a bluish color; the developer works slowly, depositing nearly all the silver upon the whites, thereby giving too great a density to the negative, and with difficulty bringing out the details. The result is an imperfect negative, with very little chance of doing better next time. Heat increases chemical action and cold decreases it. Cold renders long exposures necessary, and produces hard negatives without detail. On the other hand, too high a temperature will give flat negatives without contrast, with a tendency to spontaneous reduction otherwise called fog. We must, then, to be successful, steer clear of both extremes. If possible, the temperature of the rooms should never be below 55° nor above 70° F. This temperature should be maintained as near as possible, night and day, by the aid of artificial heat. More particularly is it necessary at night, because, when the heat is allowed to go down after the work of the day is done, the chemicals are all chilled by morning, and, although it may take but a few minutes for the room to get comfortable, it will take many hours for the heat to penetrate through the bath and solution, and just as they begin to get in tolerable working order it is time to close business, and you go again in the morning to find the same trouble.

Another strong reason for an even temperature is to be found in the fact, that a sudden rise of temperature in a cold room condenses moisture upon your negative glass and the lenses of your instrument, upon the same principle that it does upon a pitcher of ice-water when carried into a warm room. This moisture will cause the film to slip off your plates during the manipulations, unless they are warmed sufficiently to drive it off before coating.

GEORGE H. FENSMORE.

May 10, 1917.



THE WORKROOM

By the Head Operator



THE CARE OF APPARATUS
WATER

PHOTOGRAPHING MACHINERY AT WORKS
THE SULPHIDE TONING OF BROMIDE PRINTS
THE AMIDOL DEVELOPER

TEAR MARKS

HOW TO STRIP BROKEN NEGATIVES

COPYING FADED PRINTS

STEAMING OF BROMIDE PRINTS

BLUE TONES ON DEVELOPING PAPERS

SMALL ENLARGEMENTS

BROMIDE VIGNETTING

ENLARGING SINGLE FIGURES FROM GROUP NEGATIVES
INFLUENCE OF POTASSIUM BROMIDE IN THE DEVELOPER ON SULPHIDE TONING OF BROMIDE PRINTS

WIDE-ANGLED VIEWS

INFLUENCES MODIFYING COLOR RENDERING

STEREOSCOPIC WORK

CHEMICAL ANALYSIS OF GELATIN DRY-PLATES

A SIMPLE TEST FOR PURE PAPER

MULTIPLE NEGATIVES

RANDOM NOTES

The Care of Apparatus

THE bad workman who always finds fault with his tools is well known to us all, by reputation if not by actual experience of him; but no one seems to have troubled to find out why he finds fault with them, and whether, after all, his complaints are not sometimes justifiable. For one thing, a bad workman requires better tools than a good one, since he has neither the wit nor the skill to make up for the shortcomings of inferior ones, although it is foolish for even the best workman to handicap himself by the use of such. We rather suspect that, after all, laziness was at the bottom of his trouble, and that he found fault with his tools because he did not give them the care necessary to keep them in good working order. Ingenuity is a good thing, and will often help one out of a difficulty, but thoroughness is better, and the feeling of confidence begotten of reliable apparatus is more satisfactory than the thrill of relief experienced by the skillful avoidance of a totally unnecessary disaster. The operator, whether engaged upon indoor or outdoor work, needs to keep a watchful eye upon his apparatus lest it breaks down at a critical moment, when there is no possibility of repairing it. It takes a lot of explanation when an operator misses an important subject because his camera front has given way, and there was no time to refix it, and in the majority of cases he will only have himself to blame if he is requested to exercise his talents in another establishment. The accidents which are unavoidable must be endured, but those which could easiest be avoided cause the greatest annoyance when they happen.

It should be assumed that every well-made camera can be opened, closed, and all its adjustments made without any perceptible effort being necessary. Just as pain is simply a sign that there is something wrong with the vital organism, so any stiffness or jamming in a camera is a sign that something is displaced or has become bent. If a camera be forcibly closed it means that a strain has been put upon some part not designed to bear it, and after this has been done for a few times we find to our dismay that one of the clamp-

ing rods has given way, or that the bearing of the focussing pinion has been torn up "by the roots." In closing a conical camera care should be taken that the baseboard is racked right home, that the rising front is set to its correct position, and that any screws which have to fall into place upon the baseboard are in their correct position—that is to say that, if there is a hole made to receive an oblong nut, the nut should not be left at right angles to it. Many cameras of this type are ruined by a want of these simple precautions, crumpled bellows, bent struts, and bruised wood-work being the usual results. The parallel bellows camera does not call for so much care in handling, but even with this the baseboard is frequently strained through closing the camera with the reversing back in the position for "upright" pictures, in which case the hinges of the focus screen usually foul the long brass runners of the baseboard. Injury may also result from failure to close and secure the swing-back, or to attempt to fold the baseboard with the inner frame racked out ever so little. The hinges of dark-slides are often badly strained through attempting to close them with a displaced partition or badly fitted inner frame. It is, of course, impossible to close the slide under these circumstances; but a few good wrenches given before looking for the trouble soon leave their impressions. Tripod stands are often damaged by turning the members in a direction contrary to that in which they are intended to go, and spring catches are wrenched off because a piece of shaving or other foreign substance is in the hollow beneath the press button. Lenses are usually only damaged by the want of proper packing. Every lens should have its own case, or, at all events, a thick chamois leather bag, to which it should be returned immediately it is removed from the camera. Crossed threads on the lens cells and tube frequently result from hurried handling, and, having once been started, are likely to recur every time the cells are unscrewed. In such case the lens should be returned to the maker to have the false thread obliterated before the original one becomes quite destroyed. Lenses should never be cleaned with putty powder, rouge, or any

cleaning material, and should be wetted as little as possible. A drop of pure alcohol and an old handkerchief are the only safe materials in unskilled hands. If any moisture condenses upon a lens it should be wiped off at once and not allowed to evaporate; if this is not done quickly "rust" will probably appear, and the more expensive the lens, as a rule, the greater is the liability to staining from damp.

It is not advisable to use any spirit polishes or "revivers" for cleansing and renovating the woodwork of cameras or other apparatus; a good furniture cream thinned with turpentine will clean and polish, or if a home-made preparation is wanted, a teaspoonful each of olive oil and good vinegar well rubbed on with a morsel of flannel and polished off with a clean duster will work wonders. If grooves or other wooden surfaces require lubrication, do not use grease, but dry blacklead, or, better and cleaner, French chalk, and it may be worth noting that for all photographic purposes French chalk scraped off the lump is much better than that purchased in powder. If blacklead is preferred, a carpenter's pencil affords the cleanest and easiest method of applying it. Every camera case ought to contain a repair outfit, which need not be larger than its crew prototype. It may consist of a small wire screwdriver, a roll of rubber plaster, a small tube of fish glue, and a few very small screws, tacks, and pins. With these most temporary repairs may be effected, and a journey home for repairs avoided.—*British Journal of Photography*.

Water

Of all the materials used in photographic work, water is most largely employed; and to water is given the least attention of any photographic chemical.

Water is a chemical, just as much as pyro or citric acid; but because it occurs so abundantly in nature we are apt to overlook this point, and, in fact, to ignore water altogether, and to look upon it as merely a necessary commodity.

It is quite a common thing to see in published formulæ the recommendation of distilled water; thus, in making up toning solutions and developers distilled water is almost invariably recommended; sometimes you will see the phrase "distilled or boiled water," showing that there is some definite preference for these over ordinary or tap water.

Water should be a plain combination of the gases hydrogen and oxygen; but tap water contains numerous impurities, such as iron, chlorides, etc. Hence the man who despises distilled water, and makes up his solutions with water from the faucet, runs many a risk, and sometimes gets trouble, which he, of course, puts down to inferior plates or paper.

Sodium chloride is well known to be a restrainer of developers, and therefore if one week you make up a stock of solution with city water, you may not find it work quite the same as another solution you make up the next week. The quantities of impurities in water vary frequently, and tap water is in consequence an uncertain element.

Iron causes many troubles, depending on the character of the solution; thus a pyro-ammonia

or hydroquinone-soda developer will give rise to purple or black spots (respectively) in plates, which appear on and after fixing if the city water contains iron. There is so much rust, etc., in the water in some districts (especially when any alterations are being made in the mains by the local authorities), that sometimes it is quite desirable to lay four or five thicknesses of muslin over the faucet. Try this experiment yourself, and after a week remove the muslin and examine it; it will probably be quite reddish-brown with rust.

City water also contains lime and magnesia, the former being the chief cause of "hardness;" temporary hardness is removed by boiling the water, *i. e.*, the calcium carbonate is precipitated, and living organic matter is similarly destroyed; otherwise boiled water is little preferable to tap.

Distilled water, which is condensed steam, is practically pure, and should really be used by careful workers in the making up of every solution except the fixing bath. If this be done, you will then know that solutions made at different times will always be alike, unless perchance impure chemicals be employed—but this is not very likely at the present day, save in one or two cases. The following tests for water will prove of interest, and it will be worth while making a note of them in the dark-room for reference.

Chlorides. Dissolve 10 grains of nitrate of silver in an ounce of distilled water; add a few drops of this to some of the water you are testing; the latter will at once turn milky if chlorides are present, and on adding a little ammonia it will become clear again.

Iron. Add 2 drops of strong nitric acid to about 4 ounces of the water, and boil the water in a glass beaker until it has become reduced in bulk to about half an ounce; let it get quite cold, and then add 4 drops of a 5 per cent. solution of potassium ferrocyanide, and stand the beaker on a sheet of white paper. If iron be present, the water rapidly assumes a blue color.

Organic matter is present in city and rain water, but the latter is in other respects equal to distilled, and if boiled first may safely be used for making up developers, but not gold toning baths.

Photographing Machinery at Works

Of all the troublesome jobs which have to be undertaken by the photographer there are none that call for more resource and technical skill than the photographing of a piece of complicated machinery. Nine times out of ten the work has to be done under circumstances that would make even a simple bit of work difficult. As often as not the point of view required is one facing the largest light, and neighboring objects throw cross shadows that still further confuse the crowded details. Working under these adverse conditions, the photographer is expected to produce a print in which the important parts that call for attention stand out clearly, free from shadows of other objects, and relieved against a white or light-gray background.

A good deal of judgment and quiet assurance are required in making the preliminary arrangements. Generally speaking, the people for whom the work is to be done know nothing of the

photographer's requirements, and may be inclined to look upon his requests as being unnecessary. If he knows exactly what he wants, and can discriminate between what is capable of being done and what is practically impossible, and can, if required, give convincing reasons for what he wants done, his clients are likely to prove amenable to reason.

In the first place, it is imperative that he should have sufficient room in which to work. He is, presumably, provided with at least a couple of lenses embracing different angles on the plate to be used. An exact knowledge of what they will include at different distances, and a foot-rule, will assist him in coming to a rapid decision as to what alterations are absolutely necessary, and how they may best be made. Fussiness and contradictory orders will ruin his reputation at once. As an instance of this sort of thing in my own experience, an elaborately built-up platform was moved at the request of the photographer several yards three times, and was finally placed within a foot of its original position.

When the machine is too heavy for easy removal, and the lighting is altogether unsuitable, temporary blinds and the use of artificial light to supplement the exposure may have to be resorted to, while to overcome cross shadows reflectors may have to be employed. White tissue-paper lightly attached to the window will soften an overstrong direct light, and at the same time will diffuse that which passes, with the result that gleaming high-lights from the polished metal will be less obtrusive, and the deep shadows will be better lit. In some instances the windows may have to be blocked up with brown paper and artificial light used. Sheets of white cardboard may be placed in such positions and at such angles as to reflect the light into the deeper shadows.

When artificial light has to be used to supplement the exposures, magnesium ribbon will be found the more generally useful. There are many flash lamps on the market, but in my own case I nearly always get all I want with pieces of magnesium ribbon held in a pair of pliers and kept moving. The main light and shade are best given by daylight, the ribbon being used to give a little illumination in the darkest corners, just as reflectors might be. It is better in all classes of work, and most particularly with regard to machinery, to diffuse the light through a screen of tissue-paper than to allow it to fall direct upon the bright metal. The magnesium candles now sold may also be found useful. In using these the tissue-paper screen should also be employed.

As the blocking out from the negative of other objects than those required is a difficult and tedious process, it is much better to go to some trouble to rig up a suitable background. The white sheets sometimes offered for the purpose in engineering establishments are worse than useless. They are, as a rule, badly creased, dirty, and fall into unsightly folds. Stout white paper, such as is made in large sizes for draughtsmen's use, is distinctly preferable, and, if neatly joined with a mountant that is nearly dry, a background of practically any size may be

made up that will require the minimum of re-touching.

It is, of course, quite useless to make the exposure while other machinery is at work. However solidly built the workshop may be, there is always a certain amount of vibration that will cause blurred outlines in the negative. When a large number of workmen are employed, it is hopeless to expect that the operations will be stopped for an hour or so to enable the photographer to make his exposure. The breakfast time or the dinner hour should be selected, and all arrangements should be completed in advance, so that the fullest advantage may be taken of these periods of cessation of work.

The vibration of the premises is not the only cause which leads to blurring. Currents of heated air are quite as troublesome. In one case that came under my notice, an engine that had to be photographed was running until within a few minutes of the time when the exposure was made. The cylinder was still hot, with the result that the hot air ascending from it caused all the adjacent parts to be badly blurred. It is only necessary to stand at the side of a fireplace, or gas stove, and notice how the current of ascending hot air gives to all objects beyond the appearance of motion to realize this.

The color of the machinery and the nature of the paint used are also points to be taken into consideration. It is common to give machinery a first coat of lead-colored paint, and as this has a dull surface it is much better for the photographer's purpose than the glossy, non-actinic blacks, greens, and reds which are used for the last coat, and better than the oil-stained raw material. If this be pointed out to the person in charge, arrangements can generally be made to have the photograph made at that stage.

It will usually be found that all the bright parts are smeared with oil. In itself this is rather an advantage than otherwise, since it helps to reduce the excessive contrasts, but the irregular coating will certainly show in the finished print and be an eyesore. A piece of clean cotton waste should be used to remove the irregular smears. Shafting and cylinders should be wiped in the direction of their length, care being taken not to introduce wave-like markings. In wiping globular and irregular-shaped turned work, the waste may be passed round the work, when by pulling first one end and then the other of the waste a regular appearance will be given to the surface.

When all has been done to reduce contrasts by diffusing the light, and to avoid halation by backing the plates and adopting rapid development, there are almost certain to be some defects to be removed from the negative. Bright patches of light will be reflected from angles and globular parts of the polished work. These must be rubbed down on the negative, and for that purpose I find the mechanical reducer introduced by Mr. Baskett is much better than wood alcohol. The reducer is made by mixing together a twopenny box of Globe polish, 2 ounces of terebene, and 2 ounces of olive oil. The mixture is strained through a piece of fine muslin and applied with the sharpened end of a cork. It will readily remove small, obtrusive

high-lights. Larger parts are dealt with by using the flat end of a cork.

Joints in the paper background may, of course, be removed in the ordinary way, and if reflectors and magnesium powder have been used to equalize the lighting, the negative should require but very little working up.

The Sulphide Toning of Bromide Prints

PROCESSES of sulphide toning may be divided into two general systems, one being distinguished as direct, and the other as indirect. In the former the toning is effected by the simple immersion of the print in a solution in which it is left until the desired result is obtained. Hypo-alum toning is one such method, but this will be treated later in a special article, and for the present we shall only touch one other direct method. Indirect methods involve the use of two or more baths, one of which is usually a bleaching solution, and these methods being perhaps more used than any others are generally the ones meant when we speak of sulphide toning.

The First Essential

Whatever method is used, whether direct or indirect, we must of necessity start with a good bromide print as a foundation, and a print suited to sulphide toning must have certain qualities which are not necessarily essential in an ordinary black tone print to be preserved untuned. There is a considerable degree of latitude in bromide paper, and a good black print can be produced in several ways—that is to say, of two prints, each good in its way, one may have received a brief exposure and been developed up to its limit, while the other has been exposed for a longer time and development has been stopped before it went too far. As they are, either print may be quite satisfactory, but for sulphide toning only the first one is of use in producing really fine results. Properly treated, it will give rich brown tones, while the other at the best will only give poor, feeble browns. It is therefore essential to adjust the exposure, in the first instance, so that prolonged development up to the limit will yield a satisfactory print. As bromide paper develops rapidly in any case three to four minutes may be looked upon as a long time, and it is a safe general rule to adjust exposure so that full development may be reached in *not less than* three minutes. If it is necessary to snatch the print out of the developer in two minutes to save it, we can feel certain that the print will be of no use for sulphide toning, though it may make a very passable black print.

It must also be remembered that a print of the right quality can be produced only from a good clean negative free from fog. A negative of the kind that will either enlarge well or give a good carbon print is the type to aim at. Thus if sulphide toning is intended, we must keep the fact in view from the very beginning of our photographic operations if good results are to be secured.

The General Toning Process

The most usual and most general process of toning consists of first bleaching the print, and then following with a solution of sodium sulphide. Many bleachers are available, but the best and most convenient for general use is a solution containing potassium ferricyanide and either potassium or ammonium bromide. The following is a good formula:

Ammonium bromide	100 gr.
Potassium ferricyanide	300 gr.
Water	20 oz.

The print is immersed in this, and when bleached is washed for a minute only. It is then covered with a solution of sulphide made as follows:

Stock solution—

Sodium sulphide (pure white crystals)	4 oz.
Water	20 oz.

Take 3 ounces of this stock solution and make up to 20 ounces for use.

A few seconds in the sulphide bath will give a full brown tone, and then the print is well washed and dried. The washing after fixing and before bleaching must be very thorough, and some workers claim that better tones are secured when the print has been hardened in chrome-alum, or when the chrome-alum acid fixing bath has been used. It is advisable to harden in warm weather, but whether the hardening really affects the tone is somewhat doubtful.

Other useful variations concern the bleaching process and the preliminary treatment. Soak the print in water, and then immerse for six minutes in a mixture of equal parts of 10 per cent. ammonium bichromate and 10 per cent. ammonium bromide. Rinse once or twice, and then bleach in

10 per cent. ammonium bi-chromate	5 oz.
10 per cent. ammonium bromide	5 oz.
20 per cent. potassium ferricyanide	10 oz.
Anmonia .880	2 dr.

Wash and tone in the usual sodium sulphide bath. The tone produced may be described as cold sepia, which is a very desirable tone in many cases.

A rich warm sepia is produced by adopting the same method, but using as a bleacher the following bath:

10 per cent. ammonium bi-chromate	10 oz.
10 per cent. ammonium bromide	10 oz.
Nitric acid (strong)	20 mm.

As before, we first soak in the bath of bi-chromate and bromide, then rinse and bleach, wash, and tone.

All these methods give quite distinctive shades of brown, and form a useful series of processes. Bright red tones may also be produced by following the ordinary sulphide toning process with a gold-toning bath. The following is a recommended formula:

Water	4 oz.
Ammonium sulphocyanide	40 gr.
Gold chloride	4 gr.

The print must be well washed between sulphiding and gold toning, and it is as well to follow the gold bath with a fixing bath of hypo, finishing, of course, with another good wash.

Restoration of Badly Toned Prints

Failure may result if an unsuitable bromide print has been treated, or as the consequence of using a nearly exhausted sulphide bath, and in such cases the print can be restored by re-bleaching in the following solution:

Copper bromide	130 gr.
Sodium bromide	2½ oz.
Water to	10 oz.

After washing, the image can be re-developed with an ordinary bromide paper developer, and the result generally will be a dark brown, though sometimes a black image may be secured. If the full original density is not reached, it is due to the fact that an impure or much exhausted sulphide solution containing hypo was used in the first toning process, and in this case the print is, of course, beyond restoration.

Liver of Sulphur Toning

We now come to a direct toning process that is not very generally known, though we believe it to be largely used in commercial work. The print, after fixing and washing, is hardened in a chrome-alum bath, then washed again for five minutes and transferred to the following bath:

Liver of sulphur	1 dr.
Water	20 oz
Ammonia .880	a few drops

The liver of sulphur should be dissolved in boiling water, and the bath should be used at a temperature of about 105° F. Toning is very rapid, and the color is a very rich brown.

Hardening the film before toning is not always necessary, but it is generally advisable, and the simplest method of securing it is to use a chrome-alum acid fixing bath instead of a separate alum bath. It should be specially noted that the print must not be dried between fixing and toning, otherwise the toning process may hang fire and only take place at a very high temperature. As a rule, glossy or semi-glossy papers tone more rapidly than papers of "ordinary" or matt surface, which require a little longer time. If the print is to be glazed it should be passed through a chrome-alum bath before squeegeeing down, as the hot bath softens the film very considerably.

Failures

Failures in the matter of tone depend on conditions already noted, the most usual cause being the use of an unsuitable print. A very common trouble is the appearance of blue stains, which may result either from iron coming into contact with ferricyanide contained in the paper, or as the result of acid decomposing the ferricyanide. To prevent such stains, the ferricyanide should be as completely washed out

as possible after toning, special care being taken with regard to the back of the print, which requires as much washing as the front. Also if the water is supplied through iron pipes, a tap filter should be used to keep back iron specks which will cause numerous blue spots. No acid bath should be applied to a toned print, and the mountant used should be free from acid, and also should not contain any common alum, which is often contaminated with iron as an impurity.—*British Journal of Photography.*

The Amidol Developer

AMONG amateur workers the amidol developer, except for bromide paper, does not appear to be very popular. Among skilled users of bromide paper it is undoubtedly—and quite rightly—the most popular developing agent, but for negatives it is not much in favor. The reason, no doubt, is, in the first place, the very inferior keeping qualities of the developing solution, and, in the second place, the idea that amidol is not a developer subject to modification, as advisable at times. To the first objection there is, unfortunately, no answer, or, at any rate, not one which can be put forward for application without exception. Amidol does not keep well in solution, and for its proper action the developer should be used within (at the most) two or three days of making. On the other hand, the amidol developer is quite easily and effectively modified for dealing with under- or over-exposure, and for producing negatives of a soft or contrasted character.

Properties of Amidol

Unlike almost every other developer, amidol works without addition of alkali, such as soda carbonate, caustic soda, or ammonia. In fact, it cannot be safely used with any alkali in the formula, unless, of course, the alkali is neutralized by some other ingredient. If distinctly alkaline, the amidol developer yields negatives clouded by chemical fog. By using a very small dose of alkali and by exercising due care as regards the time of development, the fog may be slight; but it can easily be so great as to render the negative quite useless. Amidol, in fact, works in admixture with soda sulphite alone. Addition of further sulphite acts to some extent as an accelerator, increasing the activity of the developer and bringing the action of the solution nearer to the point at which fogging is produced. On the other hand, very slight addition of acid, usually in the form of an acid sulphite, has the effect of greatly restraining the amidol developer, prolonging the time of development, but, at the same time, yielding negatives remarkably free from any kind of development fog. In France particularly the so-called acid amidol development has found enthusiastic advocates, although opinions differ as to the practical advantage of this form of the developer. Two kinds of restrainer can thus be used in the amidol developer, one potassium bromide, used in the ordinary way, and the other an acid solution of, say, citric acid of 10 per cent. strength, or a solution of potass-metabisulphite or acid sulphite of soda.

Making the Developer

Although the amidol working solution does not keep, the fact presents really very little obstacle to the regular use of the developer. It is necessary, in order to obtain the developer in the best working condition, to add the amidol dry at the time of use, employing some small measure, such as a tiny spoon or capsule, or a small glass tube, to measure the quantity required for 5, 10, or 20 ozs. of the developing solution. The only other ingredient of the developer is soda sulphite, which may conveniently be kept in a 10 per cent. solution, so that the normal amidol developer is made up as follows:

Amidol	20 gr.
Soda sulphite, 10 per cent. solution	5 oz.
Water	5 oz.

Potassium bromide may be added in quantity from $\frac{1}{4}$ gr. (5 minims of 10 per cent. solution) per oz. of the working developer as found necessary for the particular brand of plate which is being used. It should be borne in mind that amidol does not work well with old sulphite solution, and sometimes one comes across sulphite which yields foggy results in conjunction with amidol. But with sulphite of good quality the stock 10 per cent. solution will keep in condition for several weeks, that is for the development of negatives. For bromide prints where the color of the image is a most important part of the result, it is practically a necessity to use not only a freshly made solution of the amidol in sulphite, but also to employ a solution of sulphite itself which is not more than two or three days old. The developer made up according to the formula given above yields negatives of rather softer character than the normal within about five minutes' time of development. For greater contrast development requires to be proportionately longer; but amidol is a developer which is kind to the photographic plate as regards absence of fogging propensity, while the absence of alkali in the composition of the solution is a feature which recommends it to many workers who dislike the action of alkaline baths on the fingers. For softer negatives, or for cases of under-exposure, the best course is to dilute the developer with half its bulk or twice its bulk of plain water.

An Amidol Stock Developer

Although, as I have said, the sulphite solution for amidol requires to be used within a comparatively short time of making, yet the special variety of stock sulphite solution, used for the "B. J." formula for pyro-soda, serves well for amidol also. I gave the proportions in my article of a fortnight ago, but repeat them here: 4 ozs. of soda sulphite and $\frac{1}{4}$ oz. of potassium metabisulphite are dissolved in 20 ozs. of water. The water should be moderately hot; the sulphite should be dissolved first, then the metabisulphite, and the solution then preferably brought to the boil, though this latter is not absolutely necessary. This solution itself keeps remarkably well, and is used in the same way as a 10 per cent. sulphite solution for compounding with the dry amidol. The proportions, however, are:

Amidol	20 to 30 gr.
Stock sulphite-metabisulphite solution	2 oz.
Water, to make	10 oz.

This working developer is somewhat slower in action than the normal formula, but it keeps in good condition for, say, a week. As it can be used repeatedly it is a more convenient and economical form of the developer.

Acid Amidol

Just as the formula last given acts more slowly from the fact that the slight alkalinity of ordinary sulphite is neutralized, so a still slower developer is produced by addition of small quantities of weakly acid substances, such as potassium metabisulphite or acid sulphite of soda. I cannot say that I have had any great experience of this form of the amidol developer, but so many workers have written in praise of it, and particularly of the absence of any fog when it is used, that I ought to refer to it here. It should be said, also, that a developer of this form has been found excellent for plates which, from their age, have been found liable to fog with other developers. I hesitate to give a formula, since I see that very widely different formulae have been given as satisfactory by other workers. My readers can, perhaps, do best by taking the second formula that I have given in this article as a basis and further adding to the working solution at the time of compounding the developer for use a small quantity of potassium metabisulphite. You can make a solution of this salt of, say, 5 per cent. strength—that is, 1 oz. in 20 ozs. of water. Every 20 minims thus represent (nearly enough) 1 gr. This solution is used instead of part of the 8 ozs. of water given above. In this way potassium metabisulphite may be incorporated in the working developer up to a maximum of 190 grs.—say, 20 grs. per oz. This, so far as my own limited experience has gone, is a very large amount indeed, and enough to make development an impossibly long operation. I should say that 1 to 3 grs. per oz. of additional metabisulphite is as much as can usefully be made—that is, from $3\frac{1}{2}$ to 10 drams per 10 ozs. of working developer.

Stains

Amidol, it should be said, is not innocent of causing stain on the negatives. The yellow stain which at times is produced is the result in most cases of staleness of the solution, or of bad sulphite in making up the developer. Unfortunately, the developer does not show by any color of the solution itself that negatives will be stained. Moreover, the stain is a very persistent one and does not yield very easily to such customary remedies as acid chrome alum solution. But with ordinary care in working stained negatives are very exceptional. On the nails and fingers, however, the stain is fairly common, and again a difficult one to get rid of once it has appeared. The best preventive is to keep at hand a basin containing plain water made acid with a few drops of strong nitric acid, dipping the fingers into this and then rinsing them in water after contact with the developing solution. —*British Journal of Photography.*

Tear Marks

A BLEMISH on a negative, which looks precisely as though a distressed worker had let a tear fall upon it, is not usually due to this, but has its origin in drops of water allowed to remain on the surface of the gelatin when the rest is surface dry. The result is that in those parts the film has taken a much longer time to dry than elsewhere, and in consequence the density is not the same. There is no remedy for a tear mark when once it has appeared, except careful retouching; but such marks are easily avoided by giving a glance at the negatives after they have been put up to drain for a few minutes. If a drop has formed it can be removed by a sharp swish to the plate, or a clean folded handkerchief may be used to wipe the whole surface. There is no risk of injury if it is done gently.—*Photography*.

How to Strip Broken Negatives

ONE of the tasks which confront the photographer occasionally only, and therefore are not likely to find him very familiar with any method of dealing with them, is the removal of the film from a negative the glass of which is broken or cracked. It is easy enough to get the film off the glass; but it is not so easy to do it in such a way that it will give an undamaged print. A little trouble must be taken, though very little skill is called for.

The film of gelatin which holds the image on a glass plate is an extremely thin one; so thin that without the glass to support it it would be quite unmanageable. When it is to be stripped, therefore, it must be provided with some kind of reinforcement, which will give it the required substance. This is best done by means of collodion and gelatin, as will be described.

Before any other operations are put in hand, if the glass is broken, or if there is any chance of the crack progressing so as to cause a complete severance, accident to the film from such a thing must be prevented. To do this, another piece of glass the same size, or larger, is taken, and upon it two or three spots of Canada balsam are placed, their position being governed by the pieces into which the negative has been divided by the fracture.

The negative is laid on this, film side upward, and the whole placed in a warm oven (not hot) for half an hour or so. This will have softened the balsam, and the weight of the negative will have flattened it out; so that if the two plates are put aside, in a horizontal position, until the next day, they will be found adhering to each other well enough to be freely handled.

Plain or enamel collodion is then required. An ample pool of it is poured on to the middle of the film side of the negative, which is then tilted so that the collodion flows into each corner in succession. When it reaches the fourth, the angle of the plate is held over the mouth of the bottle, and the negative gradually raised so that the surplus collodion flows off into the bottle again. When the continuous flow ceases, the negative is raised to the vertical position on a piece of card or paper, still with that one angle lowest, and is rocked on that point from side to side for a minute or two, to prevent the coating

from setting in ridges. It may then be put on one side, out of the reach of dust, for the collodion film to get perfectly hard and dry, which it will do in an hour or so.

A solution of gelatin may in the meantime be prepared by soaking forty grains of any plain white gelatin in cold water until it is thoroughly limp, adding half an ounce of water to the jelly-like mass, and placing the vessel containing it in another which has been filled with very hot water. The gelatin will soon liquefy, and, if it is not then quite clear, may be strained through a piece of cambric, such as an old handkerchief, into another vessel, also standing in hot water.

The plate is then supported on a level surface and coated with the gelatin on the top of the collodion. An easy way of doing this is to place three drawing pins points upward in a triangle, adjusting them with paper or cards underneath them if necessary, so that a piece of glass laid upon them will be level when tested in all directions.

On the points of these pins the plate is placed; an ample pool of gelatin is poured in the middle of it; it is tilted so that the liquid flows all over the surface—if some is spilt it does not matter—and is then left on the pin points for a few minutes. When the gelatin is no longer liquid, the plate may be stood up on end and left for a day or two for this second layer to get thoroughly dry.

All this may seem to be a lot of trouble; but the operations do not take very long and are not elaborate, while the good results of them are soon apparent. The negative is ready for stripping when the gelatin is thoroughly dry. Four cuts are made with the point of a knife, guided by a straight edge. They should go right down through the film to the glass, and should be about an eighth of an inch from the edges of the glass. The negative is then placed in a solution of one part of formalin to nine parts of water for half an hour, in order to toughen the film of gelatin, so that it may stand the handling. After this it is washed for a few minutes under the tap and placed in the stripping solution.

Very dilute hydrofluoric acid is the stripping agent. It is one of the few substances which act quickly on glass, and, by destroying the surface of the glass, it liberates the film of gelatin. The acid is very corrosive. It cannot be kept in glass or earthenware bottles; but is supplied in vessels of rubber or of lead. The fingers must be kept from contact with it, as it attacks the skin.

A xylonite dish—this material being unaffected by the acid—may be used for stripping, and in this should be poured a little of the acid, which is at once diluted with about twenty times its bulk of water. The acid need not be measured, a little more or less is unimportant; it is best to use at least as much water as just stated.

Placed in this, the plate may be left for four or five minutes. At the end of that time a piece of wood cut to a flat edge like a chisel may be used to see if the film can easily be separated from the glass. If not it must be left a little longer. If it can, the acid is poured off and the dish filled up two or three times with water. Then the film may be gently peeled off until it is floating free from the broken glass. Thanks to the

coating of collodion and gelatin, it will have plenty of substance, and there will be no fear of tearing it. It is transferred to a clean sheet of ferrotype, drained, and when it lies firmly on the sheet may be put aside to dry.

When dry the film will either strip off quite readily or it may have to be peeled off. There is no need to mount it on glass. In its present form it is tough enough to handle and store, has no very marked tendency to curl, and can be printed from either side, just like a celluloid film. If it is preferred to have it on glass, it may be floated on to an unexposed plate, which has been fixed and washed, and may be allowed to dry upon the film of clean gelatin which such a process leaves.—*Photography*.

Copying Faded Prints

IN the ordinary routine of copying, the usual correct result to be aimed at is to obtain a reproduction as near as possible alike as the original copy, although in many cases many try to improve upon it. In the forthcoming remarks, it is proposed to show how it is possible to obtain a bright, crisp print from a very flat copy by the use of chemicals. It does not necessarily follow that the copyist must perform all the various processes mentioned below in obtaining the desired result (in fact, it would be a sheer waste of time, work and material to do so); but I wish to show the latitude there is in the after-treatment of weak copy negatives.

In the first place, the exposure has to be considered, which, when the copy is weak, is usually as short as possible, and the negative forced up in development so as to get it as bright as possible. But really in this case the plate should be over-exposed to a certain degree, and then developed to infinity, the denser the better. After the plate has been fixed it should be put (without previous washing) into a very weak solution of potass ferricyanide and hypo. As generally known, potass. ferricyanide, when used in a weak solution, always acts on the shadows first, and so, if the negative is fairly dense, it can be reduced (to a certain extent) without losing any detail. After this, if the negative is not bright enough, it can be (after washing) intensified in the ordinary way. By this stage a fairly good print should be obtained.

Presuming the original is very weak indeed, the print can still be improved upon. For instance, if the negative is not too dense it can be put into the enlarger and printed (the same size, of course) on hard paper, or even the harder grades, if a powerful light can be obtained. This would make a great difference as compared with an ordinary print made by contact.

It matters not how flat or yellow the original may be, a hard reproduction can be obtained. For one thing, a positive can be made and then a new negative made, both these being intensified and treated as already described. One advantage of this method is, if the copy is for enlarging and the original negative is inclined to be a bit dense, a new thin negative suitable for enlarging can be obtained.—F. J. W., in *British Journal of Photography*.

Steaming of Bromide Prints

THE steaming of bromide prints puts practically a new surface on the paper. Regular bromide workers make good use of this dodge to cover up traces of hand work. When a print has been worked up, by strengthening some parts with pencil, and rubbing down other parts with typists' india-rubber, the surface is anything but attractive. The way to produce a more pleasing effect is to let the steam from the domestic kettle play on the surface of the print. This partly melts the gelatin coating and allows the hand work to sink in. The steaming must be done carefully. On no account should the print be held nearer than six inches to the spout of the kettle, and it must be kept moving all the time so that the steam may act evenly all all over the surface. If one steaming is not sufficient the print should be allowed to dry before the second attempt is made. It should be pointed out that, where prints are worked up with broad masses of water color, the steaming dodge is not so effective.—*The Professional Photographer*.

Blue Tones on Developing Papers

WITH reference to suggestions for obtaining blue tones on developing-out papers, we have found that the following formulæ give very good results. First, bleach the print in—

Water	10 oz.
Potassium ferricyanide	100 gr.
Ammonia water (28 per cent.)	100 min.

After bleaching, wash well and tone in the following bath, rocking constantly:

Water	10 oz.
Ferrous sulphate	100 gr.
Hydrochloric acid c. p.	50 min.

An alternative toning bath is as follows:

Water	10 oz.
Ferric chloride	220 gr.

After toning, wash free from stain, and it is desirable to immerse the print for a few minutes in a 10 per cent. hypo solution containing 50 grains of boracic acid to every ounce of solid hypo.

The above method has not much tendency to stain the high-lights, although with all the iron toning processes there is always some slight tendency to veiled high-lights. Usually the stain in the high-lights can be removed in the washing, particularly if the water is used a little warm. We have had a good deal of success in obtaining a pure brilliant blue-print without the slightest veiling of the high-lights by toning with gold.

The following formula is a good one:

Ammonium sulphocyanate	20 gr.
Water	1 oz.

to which add:

Gold chloride	2 gr.
Water	1 oz.

The print is immersed in this bath and toned until the desired blue is reached.

The drawbacks of the above process are the length of time occupied in securing the tone, and the comparatively high cost.

We think that if the iron method recommended earlier in this letter is used, there will be no serious trouble with stained high-lights.—*Anso Research Laboratory.*

Small Enlargements

It is a popular idea with many photographers that an enlarging lantern is of no use unless for the production of pictures of some size, something larger, at all events, than the humble $3\frac{1}{2} \times 4\frac{1}{2}$ or 4×5 's that the ordinary man secures with his camera.

It never occurs to these workers that enlargements of the same size as their negatives would often—more often than not—give them pictures more pleasing to the eye of the man in the street and more pictorial from a photographic point of view than contact prints from the same negative. Yet such is the case.

The expression "enlargements of the same size" sounds paradoxical; but it is correct. What is meant is that the enlargements have the same surface measurement as the negatives, but that only a small portion of the latter appears on the paper on which the enlargement is being made. Thus, from a quarter plate negative we may select a piece the size of a postage stamp and make a quarter-plate picture of it.

The reader who asks what is the sense of that, has not yet realized the fact that many of his $3\frac{1}{2} \times 4\frac{1}{2}$ plates contain a wealth (or perhaps "abundance" is a better word) of detail which precludes all possibility of a contact print being in any sense a picture. There are perhaps three or four objects on the small negative, each of which competes with the others, and not only robs them, but is robbed by them, of the concentration of interest without which pictorial photography is impossible. If, however, instead of one print with four objects of interest, each asserting itself to the detriment of the others, we make four enlargements, one of each of those objects of interest, it may be that we shall have four pictures.

The idea of getting four pictures from one $3\frac{1}{2} \times 4\frac{1}{2}$ negative may seem rather far-fetched, and, to prevent anyone running away with the notion that a photographer should be able to get four pictures from one small negative, perhaps it should be mentioned that the suggestion of the "four-in-one" negative is used mainly for the purpose of emphasizing the point. The four pictures is not an impossibility, but more probably our quarter-plates will give us only one picture, which means that most of what went to make up the negative is useless pictorially; that, in fact, if when we were exposing the plate we had selected a small part of the view and had placed our camera nearer to it, or had used a lens of longer focus, we should have got all that was necessary or desirable. That is so, and we should also have been saved the trouble of enlarging at all. Unfortunately, however, the faculty of selection is not always so marked when

we are exposing our plates as it is when we have the negatives before us; hence the use of a small enlargement of a small part of a negative.

Exercising the faculty of selection in this manner will also be of assistance when the worker aims at something larger than enlargements of the size indicated. If you submit a print to a critic and ask what is wrong with it, he will probably tell you that it wants trimming; and if you trim off a considerable portion and again ask what is wanted, as likely as not you will be told that it wants considerably more trimming. By the time you have applied the knife or scissors your print, originally 8×10 , may be reduced to something about half-plate size. At that, however, it will probably be a picture, whereas the 8×10 print was merely a photograph. If, however, you had been able from your small negative, or from a contact print from it, to select exactly the bit which, when enlarged, would make the picture, you might have proceeded straightway to enlarge that bit on to a piece of half-plate paper, which would have been cheaper.

Of course, the advanced worker may tell you that the faculty of selection can be best exercised only when the enlarged print is before you. But we are not all advanced workers; some of us—most of us, indeed—are merely workers striving today to do something which is better than that which we did yesterday, and buoyed up with the hope of eclipsing today's work by that of tomorrow. And it is humbly submitted that what we have called the "small" enlargement will be of considerable assistance in bettering our work.

It may be urged, however, that small enlargements will assist even the advanced worker. Many a big enlarged bromide print has been made with the only result that it has served to show the maker that there were absolutely no pictorial qualities in any part of his negative; and perhaps, with this knowledge gained, he has felt that his expenditure of time has not been wasted. He may not feel the same, however, as regards his expenditure of money; and that he might have saved to a large extent by carefully studying a contact print from his negative. From that study he could surely have narrowed the pictorial possibilities of his negative down to, say, one part of it; and a quarter-plate enlargement of that one part would have been just as illuminative as, and infinitely cheaper than, his big enlargement of the whole negative.

Do not imagine, therefore, that large prints are the necessary complement of an enlarging lantern. Small enlargements may be pictures in as great a degree as large ones.

And at the very worst they are very much better than contact prints, unless in those rare cases when we have been unusually careful, or lucky, in our selection of what to include in our negatives.

Bromide Vignetting

THERE is generally more or less difficulty about vignetting bromide prints, and moreover in most cases not only is it difficult to produce nice soft

results, but it takes a good deal of time to adjust the shape to the print.

As these are very much alike in shape and size it is a waste of time to have to make new shapes for each separate portrait, and one can cut a series of say about three different sized shapes for each size head that is normally in use. That is to say, three slightly different sized shapes about cabinet size and three about carte size and so on.

The chief and most important point is to scheme things so that the shape is held in any desired position to suit the placing of the head in the plate, and that it shall be a good distance away from the front of the frame so that the result will be nice and soft, and to allow the edges of the vignette to be well diffused.

In order to do all these things and do them speedily, I have for some time employed a special frame that I have made for this purpose.

I have taken an ordinary half-plate frame, and discarded the springs and back, and on the front of it I have fixed a plain piece of ground-glass. Then on top of this ground-glass on the front of the frame I have fixed a raised square of wood about half-an-inch high which is for the purpose of keeping the vignetting shape at a good distance from the negative.

At the top and bottom of this raised wooden front I have fixed two pieces of wood across the frame, screwed on at each end, but with the middle free so as to allow a thin piece of card to be slipped through easily.

These thin pieces of card are the various vignetting shapes that I have carefully cut for this purpose.

In making these I obtained some extra strong but pliable art mounting papers, those that are sold as real vellum faced and are about two sheets in thickness. These were chosen as being more able to stand hard wear and less liable to break and rub.

Then openings were cut in these about the various sizes that are of most use to me in my own work, and in cutting these vignettes care was taken to make the teeth rather longer and finer than is generally the case, as this tends to soften the result and gives a more pleasing picture.

In use a great deal of difference can be made to the limits of the vignette if these teeth are manipulated by simply bending some of them back where it is desired to modify the results.

They should be turned outward away from the frame where it is desired that the vignette should spread more, and can be bent inward toward the negative where it is desired to prevent the spreading or to hold some part back in printing.

The actual shape should be made on a rather large piece of paper quite as broad and a little longer than the frame itself, so as to be moved about in position and thus be easily adjusted to any part of the negative, and allow for any different placing of the image on the plate.

In order to save the necessity of making a separate frame for smaller prints and negatives I have simply fitted a smaller negative carrier to this frame to take the smaller sized plates, and then, of course, smaller cut shapes are used.

A great deal depends upon the nature of the light in getting soft results, and any kind of naked light should be avoided if possible.

In my own case I have a single 32 candle power electric light that is placed about 18 inches from where the printing frame rests on the printing machine, and in all my vignette work I am careful to have one of the two diffusers that I have down so as to get a soft and even light.

Softer results still can be obtained if desired by simply keeping the frame moving about a little during the exposure, but this not only causes some little inconvenience, but at the same time is not conducive to regular and equal results, as a slight difference in the position that the frame is held for each print will make a difference in the printing shape of the vignette.

It is, therefore, a better and more regular plan if softer results are wanted to place an extra piece of diffusing material directly on top of the shape itself, and this can be done by simply sticking a piece of semi-transparent paper on the shape itself, the thin transparent paper that negative bags are made from is just right for this purpose.

Working in this way there never has been any difficulty in obtaining soft and good results even from pictures taken against a dark background, although it should be remembered that when vignetted portraits are being made it is advisable to employ a background which is quite light in its tones, although not a plain white one such as is used for sketch portraits.

The cardboard shapes will stand a great deal of wear and tear in use and should be kept hanging up on nails close to the working bench so that they can be seen easily, and one will, after a very little practice, get to know just which one will be needed for any desired result and any negative.

My own shapes have been in constant use now for at least three years and are still as good as new.

I am sure that all who have many vignettes to print will find that not only will their results be more certain and easy to obtain, but that a great deal of time will be saved by this simple method.—H. ESSENGH CORKE, in *Bulletin of Photography*.

Enlarging Single Figures from Group Negatives

It frequently falls to the lot of most photographers to undertake the enlarging of a small head or single figure which is contained in a negative or ordinary print and is surrounded by other figures, such as are commonly seen in groups, and it often happens that such figures, by reason of their surroundings overlapping part of the same, cause no small amount of difficulty to a photographer when attempting to extract the figure for the purpose of future enlargement.

In all cases where the original negative is obtainable, there is no question as to the advantage of working on the same in preference to endeavoring to gain similar ends by manipulating a print made from such negative; but it often happens that the original negative is not forthcoming, and then there is no alternative but just

to do the best with what material exists, such as a simple silver print.

Work of this description, as a rule, is seldom required from pictures that have been made within a recent period, but almost invariably falls to be conducted from photographs taken many years previously, and which are printed on albuminized paper, the texture of which is far more liable to offer difficulties than would be the case where they are printed on the more modern samples of Aristo or highly glazed gelatin or collodion surfaces.

A striking example of this sort of work has recently come under my observation, and which has proved of considerable interest in more ways than one. In the first place, the picture in question was made by means of wet collodion so far back as the year 1865. This was printed at the time on a sample of single-albuminized paper, and, notwithstanding that this silver print has been subjected to the usual exposure in a family album, at the present moment it is absolutely free from any symptoms of fading, and is a strong proof of the permanency of a well-executed silver print by means of single-albuminized paper.

So far back as the year 1865 the taking of groups, especially inside studios, by means of wet collodion was generally done in small dimensions, and therefore each of the figures (or faces, rather) is very small in the picture to which reference is being made; these probably do not exceed a quarter to three-eighths of an inch, the whole group of eight people being printed in *carte-de-visite* size.

We hear a good deal nowadays against the permanency of pictures printed by means of silver. Yet here is an instance where a print is to all appearances as fresh today as it was forty-five years ago, and is a striking tribute to the work turned out by the photographer whose name appears on the back of the card.

Somewhat recently the writer had the good fortune to spend a pleasant time with one who is now without doubt the oldest photographer in the west of Scotland, and who was an intimate friend of the brothers Mactear, and worked alongside of them in the very first days of daguerreotype and wet collodion. When speaking on the question of permanency, this gentleman remarked: "Oh, before double-albuminized paper was known, fading was never thought about." But with its introduction a sad change was brought about, and he can now point to proofs innumerable of his assertions, maintaining that all his prints dating back from the earliest days of silver printing are quite permanent, but those printed in after years seldom stood at the outside beyond six or seven years at the best.

There is no doubt, however, that the grain of the paper is liable to cause more trouble when such small heads have to be enlarged from prints on single-albuminized samples, and to avoid this grain, when work of this description has to be done, several methods have from time to time been advocated. One of these is to apply to the surface of the print a coating or wash of water-color pigment, blocking out all the surroundings of the head it is desired to extract. Ivory black and Chinese white are, when mixed, suitable pigments to employ for this purpose, any depth from

black to a light gray being easily obtained; the application of such a pigment to the face of a silver print will, with care, cause no injury, and, even in cases where the object or head is very small in size, there is no difficulty to trace round the outlines of the face with the aid of a finely pointed sable pencil. When this first operation has been successfully accomplished, a negative, in slightly enlarged form, is made in the usual way, and this is subjected to a very thorough retouching, which will, if properly done, get rid of any coarseness which is almost certain to manifest itself. Enlargements made from negatives produced in this manner yield good results when finally worked up in black-and-white.

Another method which also yields excellent results is sometimes possible of accomplishment, having the further advantage of not requiring the application of any pigment to the surface of the print. This is done by providing a cut-out mask that just fits nicely around and suits the shape of the head that is being extracted; but how is anyone to provide such small-sized masks as from three-quarters of an inch or thereabouts? Such masks are certainly not a marketable commodity, but larger sizes are, and any stock of lantern masks can be utilized for the purpose. When it is desired to mask off, say, the head and shoulders of a figure in a group, a lantern oval mask having a white surface on one side must be procured; any dealer will supply them in various shapes, and, having obtained one that just suits the shape required, it should be placed against a piece of black velvet and pinned to a board—the white side out, of course; this is then photographed in reduced size on a slow planter late, and, if a small stop be used and the plate backed and developed properly, a negative will be produced having clear glass in the centre of the oval, and sufficient density around it to enable its being superimposed on the glass side of the negative which has been made from the paper print, and which it is intended to employ in the final enlargement.

In copying the paper print, much may be done to keep back the grain of the paper by so placing the picture in the best light for the purpose. This may mean using a somewhat direct source of lighting, but in nearly every case it will be more or less noticeable, and the negative, therefore, has to be skilfully retouched. In saying this I am quite cognizant that there are those who dispute retouching in every shape or form, but my experience has taught me this, that anyone who has to cater for the public taste and to earn his bread and butter by means of photography cannot do without practising it in nearly every subject and branch of work, and I should like to know what professional can honestly say he never resorts thereto.

The fact is, modelling is an absolute necessity in nearly every branch of photography, and especially is this the case in the work referred to, and not only must the modelling be applied to the negative, but the final enlargement will also be most wonderfully improved by its aid.

It has been said that, in all cases where the original negative is obtainable, it is much to be preferred that it should be employed instead of a print from it. Of course, there will be no need

for anything like the same amount of modelling when the original negative is available, and very probably no retouching of any kind will even be required; all that is necessary being the provision of some means to shield off objectionable surroundings to the head, and even in this event the work can be accomplished without manipulating the negative at all. In many cases this is the most desirable method to follow, simply because it does away with any tampering with an original and very possibly a highly-prized negative, so that, in cases where the masking can be effected on the surface of the enlargement, it is better to arrange for it than to do so on the face or glass side of the negative.

To mask out objectionable surroundings to an enlarged head is by no means a difficult operation when proper materials are at hand for the purpose and the system employed in enlarging permits of it. In large sizes, special cut-out masks will be required, but in smaller sizes an ordinary paper cut-out mount may be employed, provided the edges of the cut-out are true, so that, having selected the cut-out aperture which suits the size and shape of the head and shoulders of the figure when it is projected in enlarged form on the copying board of the easel, and having carefully adjusted the focus of the enlargement, the sensitive paper is placed in position, and by means of the non-actinic cap of the lens the image is projected on the same. The mask is then fixed in position over the sensitive paper and the exposure made in the usual manner.

The services of a good printing-frame may be utilized for holding the paper and cut-out mask *in situ*, and when the enlarging is accomplished by daylight it is easily slipped into its proper position on the easel, and much comfort is experienced in executing enlargements in this manner.

The vignetting of enlarged heads can also be accomplished by employing a suitable cut-out mount between the lens and the sensitive paper, arranging this at the proper distance in front of the easel, and, when the form and other conditions of the negative permit of vignetting being resorted to, there is no doubt it is a very desirable method to follow. It must be borne in mind, however, that a few simple attachments will be required to hold the vignetter *in situ* during exposure. This may mean merely tacking the cut-out mask to a lath or flat stick, and nailing it on some support that will hold it steady during exposure, and the nearer it is placed to the sensitive paper the smaller the circle of light, and *vice versa*. But this is easily judged by pinning a sheet of white paper in the position the sensitive material is to occupy.

In using glass shields made in the manner suggested, by copying white masks on lantern plates, the utmost care will be required to obtain absolutely clean, clear results, and if on development of the plate it is seen that the black velvet, from overexposure, has caused a reduction of the sensitive emulsion at those parts, the negative should be treated to a local application of some reducer whereby such deposits are removed.

These glass shields are very useful, especially in cases where several enlargements are required from the same negative. By using these shields

attached to the glass side of the negative every enlargement is produced in exactly the same form, and if the same treatment is accorded each in exposure and development, there should be no appreciable difference between any of the results obtained by this method of shielding. With some of the other methods it is not so easy to get a number of enlarged prints all alike.

The Influence of Potassium Bromide in the Developer on Sulphide Toning of Bromide Prints

It is well recognized by now that the initial development of the bromide print plays the most important part in the production of a good sepia tone on subsequent sulphide toning. It is agreed by most people that development should be thorough, in fact, it has been urged that nothing short of development to the limit will ensure a good sepia tone afterward; this, as shall be shown later, is not necessarily true.

Again, it has been often pointed out that one of the most common causes of poor yellowish tones is that of using the same developer over and over again, even though the amount of developer is quite sufficient for the area of paper used. For instance, if ten quarter-plate prints are developed in two ounces of normal developer on end, it will be found on toning that the first prints developed will tone to a good sepia, while the last ones developed will result in yellowish sepias. This result has been ascribed to the effect of the bromide set free in development from the silver bromide being reduced to silver. This, however, is not so, but the poor tones appear to be the result of oxidation products of the reducing agent used, *e. g.*, amidol, metol, rodinal, etc.

That they are not due to bromide is shown by the fact that if bromide of potassium is added to the fresh developer in fairly large quantities, and the prints are developed fully, the resulting sepia tones will be found to be much colder than normal, and not warmer than those produced on prints developed to the limit with normal developer only slightly restrained. In fact, with the latter, directly development is stopped short of the limit, there is a change in the direction of yellow sepias on toning. With the heavily restrained developer (formula given later) this is not so, and unless development is stopped very early, the resulting sepias will always be good, although they vary, of course, with the length of development. Moreover, the black and white prints before toning are likewise of good quality. The main point to be insisted upon is, to always use fresh developer; it will be found that if the paper is soaked before development, a minimum quantity of developer is needed; a convenient rule being, divide the area of the print in square inches by sixty, this will give the quantity needed in ounces; thus a 12 x 10 needs 2 ounces, a 5 x 4 prints $\frac{1}{3}$ ounce, and so on.

The following tables will show the matter more clearly:

Normal Developer	
Amidol	2 gr.
Cryst. soda sulphite,	20 gr.
Potass. bromide, 10 per cent. .	2 min.
Water	1 oz.

Restrained Developer

Amidol	5 gr.
Cryst. soda sulphite	20 gr.
Potass. bromide, 10 per cent.	50 min.
Water	1 oz.

The exposed prints were made behind a gradometer, made in the usual manner of steps of translucent paper, numbered from one to thirty.

Wide-angled Views

ONE would have thought that by this time most photographic workers must have become acquainted with the conditions that produce true perspective or that cause an appearance of distorted perspective, but even in such an excellent paper as that by Mr. H. A. Gatchell on "Photographs for Reproduction," which we

Developer.	Strip.	Exposure.	Time of development	Steps from black to white.	Color on toning.
"Normal"	F	30 sec.	2 min. (limit)	5—21	Good sepia.
"	H	30 "	1 "	1 ?—19	Yellow sepia.
Restrained	A	60 "	1 "	3—18	Yellow sepia (like H).
"	B	60 "	2 "	6—19	Good sepia (like F)
"	C	60 "	3 "	7—20	Cooler sepia.
"	D	60 "	4 "	8—21	Cooler sepia still.
"	E	60 "	5 "	9—22	Cold sepia.

With another bromide paper the results were as follows:

Developer.	Strip.	Exposure.	Time of appearance.	Time of development.	Factor.	Steps from black to white.	Color on toning.
"Normal"	A	120 sec.	8 sec.	$\frac{1}{2}$ min.	5 $\frac{1}{2}$	1—23	Yellow sepia.
"	B	120 "	8 "	1 $\frac{1}{2}$ "	10	3—23	Very warm sepia.
"	C	120 "	8 "	2 "	15	4—24	Warm sepia.
"	D	120 "	8 "	2 $\frac{3}{4}$ " (limit)	20	5—24	Good sepia.
Restrained	F	120 "	30 "	1 $\frac{1}{2}$ "	3	?—18	Yellow sepia.
"	G	120 "	30 "	3 "	6	2—21	Warm sepia.
"	H	120 "	30 "	4 $\frac{1}{2}$ "	9	3—22	Good sepia.
"	K	120 "	30 "	6 "	12	4—23	Cool sepia.
"	L	120 "	30 "	9 "	15	5—24	Cold sepia.

The longer times of development were due in this last table to the use of a slow developing bromide paper on a cold day; the water of the developer could have been decreased with advantage.

It is interesting, too, to note that with the restrained developer the latitude of the paper is very much increased; for instance, in the first table strips Nos. B, C, D, E, show a constant contrast of 13 steps from black to white; that is to say, by exposing the print behind a negative for a longer time, and developing for a shorter time, one will get precisely the same print, as regards contrast, as by exposing for a shorter time and developing longer; this, of course, within the limits shown in table. Moreover, the black tones in these four strips were perfectly pure. This holds good for the second table also, for the strips G, H, K, L, show a constant contrast for 19 steps, this bromide paper being much softer under this treatment than the former.

The proportions of the developer are important, for it must be remembered that sodium sulphite is a weak alkali, while amidol is acid, and when it is added to the sulphite solution there is an interaction which can easily be detected by the odor of sulphurous acid given off. In the second formula the proportion of amidol to sulphite is much increased, that is to say, the developer is less alkaline. It is then more amenable to the action of potassium bromide, which then gives the latitude mentioned above, for if added in like quantity to the first formula, it slows development rather than exercising a restraining action.—N. C. DECK, in *Harrington's Photographic Journal*.

reprinted recently from the report given in the *Inland Printer*, we find the matter dealt with in a fashion that is likely to mislead readers. It is suggested that any object lying so near the camera as to subtend an angle of over 60 degrees will appear distorted, even if photographed with a wide-angle lens. The angle of view has, however, nothing to do with the question, wide-angled or narrow-angled views being in equally correct perspective, and also appearing to be correct if only each result is viewed at the proper distance.

The reason why wide-angled views generally appear out of perspective is that as a rule a wide-angle lens is also a very short-focus lens, so that the proper viewing distance for the print is too short for any person with ordinary vision. A long-focus wide-angle lens will, of course, only give a wide angle on an abnormally large plate; therefore such a result cannot well be produced direct in the camera, but by taking a small wide-angle view with a short-focus lens and enlarging it we can produce a long-focus, wide-angle picture with a viewing distance sufficiently great to enable us to see the result from the right point. All apparent distortion of perspective will then vanish. The effect may not be pleasing, but it will be perfectly correct as regards perspective, and the difference between wide and narrow angled views is not one of truth of perspective, but of the inclusion of a pleasing and satisfactory amount of subject.

What constitutes a pleasing angle of view depends on several factors, the subject being only one. Among these several factors there is

at least one other of a peculiarly interesting nature, chiefly because it involves certain considerations that are very generally ignored. In discussing what is pleasing and what is displeasing in matters of artistic composition there is a physical aspect that is often forgotten. In music a discord is usually displeasing chiefly (and perhaps solely) because it produces physical pain in the form of a nervous shock, and the shock is no slight one to people who are specially sensitive to sound. Similarly in vision, physical discomfort can be caused by anything that causes an awkward or strained movement of the eye, and if a badly composed picture is critically examined it will be found to contain numerous points where the moving eye is brought up with a sudden jerk and sundry lines that the eye can only follow in an uncertain and jerky fashion. A graceful curve is followed by the eye with ease and pleasure, but an awkward curve is only followed by a strained movement that, though it may not give rise to actual pain in the ordinary sense, yet causes displeasure.

In the matter of view angle we again have similar considerations. A picture including only a small angle can be viewed all over with only slight movement of the eye, which involves no conscious exertion at all, while a big-angled view requires a much greater movement, not merely of the eyes, but of the head, and so the mere looking at the picture involves physical exertion and induces weariness. So long as we are not conscious of the movement required everything is satisfactory, but the moment we become conscious of the movement we become dissatisfied. An analogous case is that of reading. If the type is set in short lines, such as those which make a single column in our pages, we can read with comfort; if, however, the lines are set across the full width of the page reading at once involves much greater effort; while when they extend to a foot, or, perhaps, eighteen inches in length, as is the case in leases and similar legal documents, the mere act of reading involves an effort that is altogether too much for many people.

Reverting to the question of a pleasing angle for a picture, it should be noted that the eyes rotate readily in a horizontal direction, but not so readily in a vertical one, whence an upright oblong is never so pleasing to look at as a horizontal one. The majority of pictures are, therefore, of the horizontal form, the vertical angle of view being smaller than the horizontal one. It is interesting to note that if we draw a simple rectangle and keep on altering and adjusting its proportions until they appear to be most pleasing the result will nearly always turn out to be a horizontal oblong with sides in the proportion of 3 to 2, which numbers correspond more or less closely with the relative horizontal and vertical view angles that the eyes will cover without any movement of the head.

Another very important matter to note is the fact that the two eyes in unison can only cover with perfect comfort a very small horizontal angle when the head is rigid. This angle is only about 20 degrees, and it corresponds very nearly to the angle included on a quarter plate by a 10-inch lens, which, by very common consent, is

admitted to be a very satisfactory angle. A bigger angle can be included by the eyes, but if the angle of 20 degrees is much exceeded, a special effort, of which we are very much conscious, is needed, and if we go to the extreme angle, which may be near to 90 degrees, the effort becomes a painful one. A wide-angled view is, therefore, never a very pleasing thing to study, even when the proper view-point is taken, so that the perspective appears correct. As a rule, we get too far away, and so get a narrow-angled view of the wide-angled picture, and then distortion at once appears.—*British Journal of Photography*.

Influences Modifying Color Rendering

THREE influences controlling modifications of color rendering in screen-plate color work are the effects of intensities, reflections, and contrasts. When dealing with ordinary monochrome photography these influences are almost ignored, but in color reproduction they obtrude themselves sometimes in the most unexpected manner; for example, an Autochrome of a street scene showed the road and pavement as a silvery blue, due to sky reflection following a sharp shower.

Extreme color intensities, when in large masses in the same picture, are extremely difficult to render, for the reason that color intensities vary considerably with the quantity of white light admixed with them: the whiter the light the more brilliant or luminous the color to the eye, and, conversely, the feebler the light the less brilliant or blacker the color. This circumstance creates over-exposure of the high-lights when endeavoring to secure detail in the shadow and dark parts, resulting in the high-lights presenting a washed-out and weak, detailless appearance. In monochrome work brilliant high-lights and deep shadows often contribute largely toward an harmonious result, but in screen-plate photography such differences in light or color intensities are best avoided.

The influence of reflections cannot be ignored. It is evident that a flat piece of pure white matt-surfaced paper, as seen in an ordinary room, cannot appear absolutely white, for all the objects in the room must reflect some colored light, and the lights reflected from different objects are usually of different colors, so that the final tint of the piece of paper depends not only upon its natural color, but also upon the presence and proximity of extraneous objects, such as curtains and cupboards. Consequently the apparent color will not be "white," but a delicate, indescribable hue of the preponderating reflected tint. If instead of the flat piece of paper we consider the appearance of a white egg under similar conditions, it is evident that the rounded surface of the egg will cause it to have a different appearance: the high-light will appear grayish, with the exception of that small portion upon which the direct light falls, which may appear white; the remainder of the light side will have a delicate grayish tint, the depth of which will gradually increase as it emerges into the deeper gray of the shaded side, which shadow will be tinged with the colors reflected into it. A glass of water placed in similar conditions will be

affected by light, shade, and reflected colors in a similar manner. Again, glazed china or earthenware, a shiny apple or a tomato, will show spots or streaks of white reflected light—images of a window—on the small portion of surface where the light falls, and in these spots *all color will be lost*, or, at any rate, considerably modified by the reflected color of the sky, while the shadow portions may even assume a different color by the admixture of a preponderating reflected tint. It is advisable, therefore, in numerous instances that high-lights be reduced by diffusion, and reflected shadow tints abstracted by suitably selected and carefully arranged reflector screens.

Color contrast should prove a valuable artifice to the screen-plate photographer in still-life studies, since it places at his command the power of increasing the value of colors; for example, placing orange and blue together intensifies both colors—the blue becomes bluer and the orange more of a red orange.

The following table indicates what change can be expected in color contrasts:

<i>Original colors.</i>		<i>Change due to contrast.</i>	
Red	Orange	Red, yellower	Orange, green gray
Red	Green	Red, unaltered, brighter	Green, brighter
Red	Blue	Red, more orange	Blue, greener
Red	Violet	Red, orange	Violet, unaltered
Green	Orange	Green, blue	Orange, yellower
Green	Blue	Green, olive	Blue, more violet
Green	Violet	Green, yellower	Violet, bluer
Orange	Blue	Orange, redder	Blue, bluer
Orange	Violet	Orange, greener	Violet, bluer
Violet	Blue	Almost unaltered	Almost unaltered

The contrasting colors may be secured either by separate objects or the employment of a tinted background. I employ a sheet of ground-glass on which I work either a suitably colored background with crayons blended with the dry fingers, or I place a sheet of colored paper at the back of the glass—the matt surface of the glass in front softens the color intensity most effectively.—*British Journal of Photography.*

Stereoscopic Work

A STEREOSCOPIC photograph consists essentially of two views of the subject taken from slightly differing standpoints, so as to represent more or less accurately the two separate views seen by the two eyes. The two photographs if mounted side by side and viewed in a proper stereoscope then appear to coalesce into one view, which represents with close accuracy the object as it appears to the two eyes when it is seen direct. The advantage of the process is that the subject appears in relief, and therefore details of form which cannot be detected accurately in an ordinary single photograph become easily apparent in the stereoscopic view. The process of stereoscopy has therefore very great value in all photographic work, the aim of which the preservation of accurate records.

The first stage is the production of two negatives from slightly differing standpoints, and it is obvious that there are several ways in which such negatives can be secured. We can use an ordinary camera, shifting its position between

the two exposures, and this may be a stand camera or a hand camera. In either case the camera must be at the same height from the ground, while the two directions in which the lens points should be parallel. With very near subjects, such as still-life objects, great accuracy must be observed in these two matters, and so we want some kind of stand which will permit the camera to be slid from side to side with a perfectly parallel movement. For objects at a moderate distance these precautions are not needful, and the height of a hand camera can be preserved quite nearly enough by holding it against a certain waistcoat button, or by holding it at eye-level. For most ordinary subjects the difference between the two positions need only be about three inches or less, and a very slight sway of the body is sufficient to secure this. So few people seem to realize what can be done in this way with an ordinary hand camera that the matter is worth special mention.

Such methods are, however, obviously of no use with moving objects with which the simul-

taneous exposure of both plates is absolutely necessary, and for such work a regular stereoscopic camera with two twin lenses is essential. Such a camera may be of any kind from a folding pocket camera, or box-form hand camera, to a stand camera. For the latter a half-plate camera is most convenient, as by changing the two lenses for a single one and removing the central partition which divides the camera into two we can use it for half-plate work. Moreover, a half-plate dark slide can be arranged to hold either a half-plate or a full-size stereo plate ($6\frac{1}{2} \times 3\frac{1}{4}$), with a very slight alteration, while a half-plate is practically large enough for the purpose. Hand cameras may be obtained to hold various size plates, from full size stereo down to the small Continental sizes (45×107 mm.), now very popular. One difficulty with the regular type of twin-lens camera is the regulation of the separation of the two lenses. Generally this should be from $2\frac{1}{2}$ to $3\frac{1}{4}$ inches, and it may well be a fixed average distance for most ordinary work. For very near work it should, however, be reduced, 2 inches being often desirable for flower work or still life subjects. If much work of this kind is to be done I recommend a stand camera with adjustable front panel permitting the lens separation to be varied from 2 inches up to $3\frac{1}{4}$ inches. A cheaper alternative is to have spare lens panels with flanges fixed at different distances, say, 2, $2\frac{1}{4}$, $2\frac{1}{2}$, and 3 inches. A hand camera may well have a fixed lens separation of about $2\frac{1}{2}$ inches for a small camera, and 3 or $3\frac{1}{4}$ inches for a full size one. It should be noted that

a small separation of $2\frac{1}{2}$ inches or less will be too little if 4 or $4\frac{1}{2}$ inches focus lenses are used, for too small a view angle will then be included on each plate, while with 3 inch lenses $2\frac{1}{2}$ inches is quite enough.

For what may be termed easy subjects, with short scales of gradation, all we have to do is to aim at correct exposure and the production of a soft negative full of gradation and in perfect focus. Any tendency to harshness is the chief thing to avoid. Landscape subjects with a long scale of gradation must, however, be treated in rather special fashion. All ideas of exposing for the shadows and letting the lights take care of themselves must be abandoned if the lights are at all powerful. Over-exposed lights are fatal in stereoscopy, and therefore exposure must be adjusted to the light and the shadows left to themselves. This method will, with an ordinary single photograph, give what is known as an under-exposed effect; but, provided the shadows are not blocked up in printing, which is a defect that must carefully be avoided in any case, a stereoscopic slide will show no under-exposure in the stereoscope. Shadow detail that is practically invisible in the separate prints will show up in a quite wonderful fashion in the stereoscope, and the result will be very realistic. On the other hand, anything in the nature of a burnt-up high light will be an eyesore in the stereoscope that nothing will alleviate. This rule of exposure is a most important one in stereoscopy. Another matter is that the effect of relief obtained in the stereoscope is largely a matter of realistic perspective, and this a matter that concerns a good deal more than simple drawing. The lens looks after the truth of the drawing, but the aerial perspective, or the correct gradation of tints according to distance and color, depends solely on true gradation, which will not be obtained in all cases unless orthochromatic or panchromatic methods are adopted; therefore, every effort should be made to secure truth in this respect.

It must not be supposed that every subject is equally well adapted to show stereoscopic effect. In fact, none at all will be apparent in the stereoscope unless one, or, better still, both, of two conditions exist. One is that the linear perspective must be strong, and the other that parallax must exist. In landscape subjects especially, the worker must look out for both in selecting his view-point, and both are fairly simple matters to understand. Parallax exists when one subject stands separately in front of another, so that each lens sees a different amount of the further subject. Thus in a view of a simple building there may be no parallax at all, but it is introduced at once by the presence of, say, a lamp-post, or a figure of any sort standing in front of the building. The nearer the figure is to the camera the greater is the parallax, and many subjects that would otherwise give only failures, from the stereoscopic point of view, may be turned into successes by judiciously including a figure, or, indeed, any kind of foreground object. With regard to the other matter linear perspective is a matter of the direction of lines, and parallel lines running away from the observer always appear to converge on a single "vanish-

ing" point, which is, in general, a quite imaginary point a very long way off. To secure strong perspective in a photograph the point to which the more important lines of the subject seem to converge must be within the view included on the plate. That is to say, if this point should happen to be a real one it must be visible in the print if the perspective is strong. If it falls outside the print the perspective will be weak, and it will become still weaker as the point travels farther and farther outside the margin. The stereoscopic worker should therefore make a point of looking for the direction of the most important vanishing point, and then select a position from which it will be included in the angle of view. This applies especially to outdoor subjects. It is of much less importance with near still life subjects full of detail.

The stereoscope is simply a convenience for viewing the prints, and some people can dispense with any such arrangement. Considerable practice is, however, required, and in general a stereoscope is necessary. It consists essentially of a support for holding the slide, with a screen arranged so that each eye can see its own proper picture alone, and lenses of a special type through which the views are seen. The chief point to note is whether the apparatus is fitted with simple lenses or with prisms. The ordinary cheap "Holmes" stereoscope always has prisms cut from lenses, and these permit the use of slides in which the prints are mounted farther apart than is desirable when plain lenses are used. Naturally, the greater the separation of the prints the larger can each print be, and so prisms have advantages. Personally I prefer this form of stereoscope, and unless a cabinet arrangement holding a large number of slides is required the cheap form of apparatus answers quite well.

The printing process used should be one showing no particular surface texture. A quite smooth but not necessarily glossy paper is best, and out-of-the-way tones should be avoided. The only varieties wanted are cold tones and warm tones, the latter not being too striking, for all subjects may be classed as either cold or warm quite irrespective of color. Blues, greens, and reds are to be carefully avoided. Soft prints full of detail are to be aimed at. If the negatives are on one plate a print taken will necessarily show the two views upside down when the right-hand one is on the right, therefore the two views must be separated and each put the right way up. They must then be trimmed, though it is best to trim the top and bottom edges before separating. Next trim off rough edges, keeping both prints the same width, and compare the prints, noting especially the edges nearest to the nearest object in the view. Trim these two edges so that on this side each print includes practically the same amount of subject. Trim the other edges to make the prints of the same width and then place the prints side by side for comparison. The outer edge of each print should now show slightly less of the subject than the inner edge of the corresponding print, and if it does not each should be further trimmed down until this effect is produced. The prints can now be mounted and their right distance apart can be determined either by the rule given in the

"Almanac" or by trial, putting the two views side by side and adjusting their spacing until the result looks quite satisfactory in the stereoscope. At this stage some people find that they are unable to get the views combined at all in the stereoscope; but assuming that everything has been done correctly this infallibly denotes defective vision and the necessity of consulting an oculist without delay. The stereoscope is in no way injurious to the eyesight, but rather beneficial, and difficulty in using it denotes visual defects that were probably unsuspected.

Transparencies can be made instead of paper prints, but as the trimming of the results is impossible it is best to cut and trim the negative with a glass-cutter and mount them on a piece of glass in the correct relative position. Transparencies can then be printed from them. Special printing frames for transposing and printing can be obtained, but I personally much prefer to cut the negatives as described. It should be noted that with a stand camera and an adjustable lens separation the subject can be so arranged on the ground glass that any after trimming of the individual prints becomes quite unnecessary. This is a very material point in favor of such apparatus, especially when small near objects are being dealt with.

Distant Subjects

These can be shown in stereoscopic relief by taking views from points wide apart, the two camera positions varying by from 1-100 to 1-50 the distance of the object. Sometimes the separation will be a very long one, and in such cases care must be taken not to include any near foreground objects in either view, for naturally each view will have an entirely different foreground. If on a moving vehicle or vessel, the second view may be taken a few seconds or minutes after the first, remembering that the greater the distance of the object the larger must be the interval. Clouds may be secured stereoscopically by standing still and taking two views with an interval of time, for in this case the movement of the clouds themselves will be a substitute for the movement of the camera. This expedient will, however, only serve if the form of the clouds is fairly constant and not rapidly changing as the effect of wind.—*British Journal of Photography*.

The Chemical Analysis of Gelatin Dry-plates

IN the case of the majority of commercial gelatin dry-plates the emulsion is one containing both iodide and bromide. In the chemical examination of these plates the experimenter generally requires to find the quantity of total silver halide and that of silver iodide. Numerous analyses of this kind have shown that it is not all the methods of separating iodine from bromine which are suitable for this purpose, while also the separation of the silver halide from the gelatin presents certain difficulties. Analysts who have occasion to undertake the examination of photographic materials may therefore be interested in noting a method which has been found to yield very satisfactory results in the examination of gelatin dry-plates.

In measuring the quantity of emulsion on the plates, one or more plates are used, say, three to four plates 7 x 5 inches size. These are weighed, the emulsion then dissolved off with hot water and the glass plates (dried) again weighed. From these two weighings the quantity of air-dry emulsion per unit area is readily calculated.

For the estimation of the total silver halide in the emulsion one to two grams of the latter are shaved off the air-dried plates, placed in a beaker in about 50 to 60 c.c. of water to swell and then render fluid on the water-bath. About 20 to 30 c.c. of nitric acid is then added and the mixture brought to the boil, when it coagulates, and the precipitate of silver halide can be allowed to settle, filtered off and washed until the wash-water is neutral to test paper. The precipitate is then dried, carefully detached from the filter-paper and the latter reduced to ash in a weighed porcelain crucible. The precipitate is then placed in the crucible, as soon as the latter is cold, the crucible heated just sufficiently to melt the silver halide, and again weighed when cold.

For the estimation of the silver iodide in an emulsion a weighed quantity, from 3 to 4 grams, of the air-dried emulsion is taken. The silver halide is separated from the gelatin as above described and is well washed. The estimation of the iodine in it (silver iodide) is done by the following method of R. Fresenius, using nitric acid. The following solutions are necessary for the process:

(a) Solution of potassium iodide of known strength. This is prepared by drying pure potassium iodide at 180° C., and dissolving an exactly weighed quantity, say, 5 grams, in 1 liter of water.

(b) Solution of sodium thiosulphate (hypo.) containing from 13 to 13.5 grams of the pure crystallized salt in 1000 c.c. of water.

(c) Solution of nitric acid in sulphuric acid, prepared by passing nitrous gases into sulphuric acid to the point of saturation.

(d) Pure carbon bisulphide.

(e) Solution of sodium bicarbonate, 5 grams in 1000 c.c. of cold water. To this solution 1 c.c. of hydrochloric acid is added.

The first thing is to ascertain the titre of the hypo. solution for iodine as follows: 50 c.c. of the potassium iodide solution are placed in a 400 c.c. bottle with a well ground stopper, about 150 c.c. of water and 20 to 30 c.c. of carbon disulphide added, with a little dilute sulphuric acid; then about 10 drops of the nitric-sulphuric preparation. The bottle is closed, vigorously shaken for some time and the contents then allowed to settle. A slight further addition of a few drops of the nitric-sulphuric mixture is then made in order to be sure that the whole of the iodine has been liberated. After further shaking and leaving the mixture to stand, the supernatant liquid is poured off as completely as possible (leaving the violet-colored carbon bisulphide) into a larger boiling flask. About 200 c.c. of water is placed in the stoppered bottle, the latter carefully shaken and the water poured off as before into the boiling flask, this washing out being repeated until the water comes

off without an acid reaction. To the contents of the boiling flask about 10 c.c. of carbon bisulphide are added, the mixture carefully shaken and poured off from the carbon bisulphide into a second boiling flask. The carbon bisulphide is washed and the contents of the second boiling flask again shaken up with a little carbon bisulphide, whereupon, as a rule, only a very faint color is imparted to it. The different lots of carbon bisulphide from the flasks are now poured on to a wetted filter and washed until the wash-water is no longer acid. The funnel is then placed in the stoppered bottle, a hole made in the filter paper and the carbon bisulphide allowed thus to join the main portion in the bottle. We now have the whole of the iodine in solution in carbon bisulphide.

Thirty c.c. of the soda bicarbonate solution are now added and addition made from a burette, with constant shaking, of the thiosulphate solution, until the carbon bisulphide is almost completely decolorized. The quantity of thiosulphate solution required corresponds with the iodine contained in the 50 c.c. of potassium iodide solution.

It should be noted that the nitric-sulphuric mixture may also be prepared by adding corresponding quantities of sodium nitrite to concentrated cooled sulphuric acid until the latter is saturated.

The silver halide obtained, as above described from a weighed quantity of emulsion and well washed, is transferred to a small Erlenmeyer flask and mixed with an excess of fine zinc shaving. Some acetic acid and sodium acetate are added and the whole placed on the water bath until the silver is completely reduced. The liquid is then filtered, the filter-paper washed, and the whole filtrate then treated as in ascertaining the strength of the potassium iodide solutions. The iodine is liberated by the nitrous acid and is dissolved by the carbon bisulphide, being then titrated by the sodium thiosulphate solution. From the quantity of the latter which is necessary the quantity of iodine as silver may be calculated. In liberating the iodine and extracting it, care requires to be taken completely to separate the iodine. For this purpose addition of the sulphuric-nitric mixture should be made to the treated solution and the latter shaken up with carbon bisulphide. In this way, as already described, the whole of the free iodine is obtained in solution, the carbon bisulphide readily separating. It is a good plan to work with fairly small bulks of solution and to check the complete separation of the iodine by adding some nitric-sulphuric mixture to the collected wash-waters.—E. VALENTA, in *British Journal of Photography*.

A Simple Test for Pure Paper

In these days when materials are so numerous and so varied testing for quality is often very desirable, and paper is one of the most important photographic materials; it may therefore be useful to draw attention to a paper read in the early part of this year before the Bureau of Standards at Washington on the subject of testing. Fuller details will be found in the

Chemical Engineer, xvii, No. 3, and the *Chemical News* for July 11, 1913. Using a testing solution known as the "Herzberg" stain, cotton and linen fibers are stained a wine-red color, mechanical ground wood fibers yellow, and chemically treated wood pulp indigo blue. Pure rag paper can therefore readily be distinguished from the inferior wood-pulp paper.

The following is the formula for making the staining solution:

A	
Zinc chloride	20 gm.
Distilled water	10 c.c.
B	
Potass. iodide	2.1 gm.
Iodine	0.1 gm.
Distilled water	5.0 c.c.

Mix these solutions and allow the mixture to stand for twenty-four hours. Then decant off clear liquid and keep in dark bottles or in the dark.

The paper to be tested is cut up and immersed in $\frac{1}{2}$ per cent. caustic soda solution, which is then raised to the boiling point. After boiling for one minute the caustic solution is poured off and the paper rinsed with water, a few drops of 25 per cent. hydrochloric acid solution being added to neutralize the alkali. The paper is then rolled up into balls of about the size of a pea; some of these are put into a test-tube half filled with water, and all is vigorously shaken until the paper disintegrates into its fibers. A few of the fibers are then picked out, put on a microscope slide, dried, stained, teased out with needles to separate the fibers, pressed under a cover-glass, any exuding dye being mopped up with filter paper, and then the whole is examined under the microscope.

Four different strengths of dye solution are recommended. One the full strength as made; one slightly diluted; one containing a few extra drops of iodine solution; and one with a little extra zinc solution. Extra iodine gives a deeper red in rag fibers, extra zinc a deeper blue in chemically treated wood fibers, while the diluted stain assists in the distinguishing of the two kinds of wood fibers, giving a clearer yellow to the ground wood. Each slide may therefore with advantage contain four specimens of fiber, each treated with one of the four stains. The character of the paper can then be rapidly determined and with certainty.

For purposes of trial and practice we may take any good quality filter paper as an example of pure rag pulp; white cheap wrapping papers and newspapers are mostly wood pulp. The best photographic papers are, or should be pure rag, the permanency of wood papers being doubtful. It must not, however, be supposed that a paper is of wood pulp because it turns blue when immersed in iodine solution. This effect is not due to the pulp but to the starch used in the manufacture or sizing of the paper. To test the pulp itself the paper must be prepared in the way described and the fibers be well separated so that the effect on the individual fibers can be distinguished. A microscope giving moderate magnification of about forty diameters is suffi-

ciently powerful for the purpose of examining the fibers. With practice various wood pulps can be identified by slight differences in color, but for photographic purposes it is perhaps sufficient to be able to distinguish rag paper from wood pulp and to determine the absence of any variety of the latter.—*British Journal of Photography*.

Multiple Negatives

THE practice of taking a number of small pictures upon one plate is of considerable antiquity in photographic chronology, dating back to the early days of the ferrotype, when "nine gems for sevenpence-halfpenny" were to be had in nearly every town. Since then cheap photographers have produced their stickybacks on the same principle, for it is only by this means that the work can be made remunerative.

Outside this class of trade few photographers think of going beyond the orthodox repeating back for two exposures, and even with that there is a tendency to use separate plates instead of making the repeat upon one of larger size. As a matter of fact, there are many occasions on which considerable economy of both time and material may be effected by making several negatives on one plate for both commercial and artistic work, while for experimental purposes the value of the practice is undeniable. In such a case as the testing of color screens, what more convenient way can be imagined than of taking the test object four times on the same plate, either with and without screens of various depths, or with one and the same screen and varying exposures. Again, where a number of small articles have to be photographed for catalogue work, it is often more convenient, especially when working away from the studio, to make four quarter-plate exposures upon a whole plate than to make each upon a separate quarter-plate. Supposing we have a whole-plate camera with three slides, we can carry plates for 24 exposures, whereas with single quarter-plates in carriers we are limited to six. Four oblong lantern slide negatives or two useful postcard sizes can be got out of a half-plate, and even the quarter-plate can be made to yield four locket pictures.

Stereoscopic negatives of still life subjects are also readily made by means of a simple masking arrangement which need not cost a single penny. The simplest multiplex attachment, which may be used in a whole-plate camera for either four quarter-plates, two half-plates, or two panoramas, $8\frac{1}{2}$ by $3\frac{1}{4}$, is made by cutting a saw kerf all round the inner edge of the reversing frame and springing in strips of blackened tin or zinc, which cover the portions of the plate which are not to be exposed. For two halves of a whole-plate we require a piece of tin $6\frac{1}{2}$ by $4\frac{1}{4}$, which is first placed at one end of the frame, the exposure made, and then slipped to the other end for the second picture; for the panoramas we have a slip $8\frac{1}{2}$ by $3\frac{1}{4}$, and place it transversely or vertically, as the subject may demand, while for quarter-plates both slips are put in, leaving a rectangular space of the necessary size. For occasional use even the groove

may be dispensed with, and a cardboard shutter may be cut so as to fit tightly into the frame. In an emergency I have cut such a mask out of an old book cover and just jammed it into the frame. If this plan be adopted it is necessary to cut a special mask for quarter-plates having one quarter cut away; this may be turned so as to expose the four sections successively. In the case of a studio camera the mask is fitted into the ordinary C. D. V. mask, taking care to place it centrally, so that as the slide is slipped along the subject will keep in position on the plate. It is desirable to use a camera in which the lens has considerable latitude of movement in both horizontal and vertical directions, so that the area of best definition and evenest illumination can be utilized. If this be lacking care must be taken to use a small aperture, especially if a short focus lens is being used.

The mask idea is carried out in a very complete form in Century Multiplying back, which is a combination of a repeating back and ingeniously designed masks, as many as twenty various sized pictures being obtainable with the one outfit, ranging from $4\frac{1}{4}$ by 2 to 1 by $4\cdot5$ inches, and the number of exposures upon one plate from two to eighteen. In this apparatus the dark slide moves laterally, giving a maximum of six positions, while the openings are arranged one above the other, one only being in action at the time, so that for eighteen exposures the top aperture is opened and six repeats made, then that aperture is closed and the middle one opened and six more made, the process being again repeated for the bottom row. Klay's Duplicator is arranged upon somewhat similar lines, but only a central opening is used, the plate having vertical as well as horizontal movements in the focal plane. A very simple form on the lines of the multisecto is made by Butcher and Son; by its aid three panels or six midgets may be made on a quarter-plate. It should be noted that all these appliances are for standard sized plates and consequently are useful to the all-round photographer, but special sized plates are usually employed by "sticky-back" workers, long strips of such dimensions as $6\frac{1}{2}$ by $1\frac{1}{4}$ or $6\frac{1}{2}$ by $2\frac{1}{4}$ being convenient for printing on bands of bromide paper, which have then only to be cut lengthways to separate the various orders.

For ferrotype work and for the production of postage stamp portraits the old form of multiple camera, which is fitted with from four to twenty-five lenses, is still used, the interior of the camera being divided into cells so that each picture is practically taken by a separate camera. The repeating back is sometimes fitted so that with nine lenses thirty-six pictures may be taken upon one 7 by 5 plate with four shifts. Such cameras are useful when the prints have to be delivered in sheets, or, as in the case of ferrotypes, where printing has not to be done. They usually have the disadvantage of being fitted with cheap lenses, and consequently the individual pictures vary in definition and exposure.

One application of the multiple negative is to facilitate the production of cheap enlargements. I have seen one of the "club" picture mills where four exposures were made upon a half-plate, all being copies. The originals were sorted into

sizes, and with one focussing perhaps twenty exposures were made, using five plates; an enormous amount of time was thus saved in handling the negatives. A special holder was used in the enlarger, the plate being slipped under springs which held it over a fixed mask, a touch sufficing to move it for each exposure. The results obtained by this simple arrangement were excellent, but fortunately fixing and washing cannot be hurried in a like way, so that the durability of such "cut price" work is more than doubtful.

For illustrative work where a number of carbons or platinotypes of small size are wanted in sets, the multiple negative system may be adopted with advantage, sheets of six or nine cabinets being little more difficult to handle than smaller sizes. Prints for mounting on Christmas cards, fancy goods, and the like being usually made this way, sometimes the compound negative is made up of small plates cemented upon a thick plain glass, as is done in the machine-printed postcard trade, but where it is possible to get all the subjects on the one plate it is more convenient to handle, and by exposing each subject independently uniform quality can be obtained. Even if sizes vary, each one can be focussed, which is not possible if one exposure is made on a sheet of mixed originals. Something on the multisecto plan can easily be devised to meet almost any case, cardboard masks answering every purpose. One precaution is necessary in such cases, and that is to avoid exposing any section twice. I avoid this by fixing a card on the back of the slide, this card being ruled in sections corresponding to those of the plate, then as each exposure is made I mark it off in pencil. A good card may be cleaned with rubber and will serve many times.—*British Journal of Photography*.

Random Notes

NICKEL-PLATED fittings can easily be cleaned with alcohol to which 2 per cent. of sulphuric acid has been added. Apply this mixture liberally and, after a few seconds, wash off with clean water. Then rub over with a swab dipped in fresh alcohol, containing no acid, and polish with a dry cloth. This method will give brilliance to the dulllest piece of nickel-plate without damaging it in any way.

THE old idea that a north light is the only light for a photographic studio is not entertained now by many leading portrait men. Here is what Mr. William Crooke, of Edinburgh, says on the subject: "My finest room—the one in which I

have most pleasure in working—is one with abundance of light from the south. You see much more in such a studio than in one lighted solely from the north. If I want sunshine in my pictures I can have it; and nothing gives me more pleasure than to see fair-haired children in the sunlight that reaches that room."

PATENT NEWS

Under this heading it is proposed to include each month a list of all the U. S. Patents; and brief abstracts of the more important, and to include also such foreign patents as present special features.

Copies of any patent can be obtained from the Commissioner of Patents, Washington, D. C. Price, five cents each.

Reflecting Camera. W. F. Folmer. 1221304.
M. P. Camera Device. W. A. P. Cathcart. 1221677.

Camera Device. H. H. Meredith. 1221558.

Camera Device. C. A. Lare. 1221062.

Color Carrier for Color Photography. I. Kitsee. 1221457.

Photographic Machine. G. Wald. 1221780.

M. P. Film Wiper. E. Ducher. 1221704.

M. P. Apparatus. J. F. Davidson. 1221515.

Camera. A. B. Elmstrom and J. A. McDonald. 1221847.

Camera Mounting. N. Pedersen. 1221902.

Camera. M. Lichtman. 1222310.

Photographic Film. J. E. Brandenberger. 1222825.

M. P. Apparatus. W. O. Worman. 1222505.

M. P. Camera. C. Kesses. 1223341.

M. P. Camera Device. C. E. Akeley. 1223332.

Cinematographic Apparatus. A. and L. Chronik. 1223147.

Film for Color Cinematography. P. D. Brewster. 1222925.

Photographic Apparatus. W. C. Huebner. 1222766.

Photographic Apparatus. G. C. Beidler. 1222596.

Photographic Apparatus. G. C. Beidler. 1222597.

Photographic Apparatus. S. A. Mischansky. 1222654.

Plate Developing Holder. L. F. Libby. 1223057.

Camera. J. A. and C. T. Desjardine. 1223858.

Shutter Operator. R. B. Leavitt. 1223807.

Color Cinematography. L. Gaumont. 1223381.

Cinematograph Apparatus. P. D. Brewster. 1223664.

Cinematograph Apparatus. M. Vandal. 1223539.

M. P. Machine Stand. P. R. Gonsky. 1223579.

M. P. Signal Device. O. B. Day. 1223771.

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MINIATURES

By MARGARET McALLISTER

ONCE more the tide of public taste has run to miniatures, and again we see the quaint oblong cases and little round gold rims on the walls. But how charming the old ivory miniatures! We look at our grandmothers with their abnormally large eyes and wonderful pink and white complexions, and admire the finished workmanship of the whole, and then we put down the little portrait with a sigh that we are only photographers, and that such art is not ours.

But do not let us be in such a hurry. If really we are photographers, then we have a certain power; we are able to obtain an image—usually a good likeness—and it is only the color that is wanting. To be sure it is a very big "only," still there is a way for some of us photographers to get a little near the effect of a painted miniature, and if not very near, to still be able to create for ourselves a more reasonable representation of a person than the cold tones of photography can give.

If we are photographers, it is probable we know something about retouching, and have had to apply a wash on the negative and spot a print; why then should we not try our hand at getting just enough color on to a print to make the subject look alive? I would recommend beginning on an ordinary platino-type in a very unambitious way, just to see what can be done. A faint wash of flesh color over a face is quite enough to stimulate enthusiasm and make the photographer eager to try more, so quickly is it done, and such a wonderful difference does it make. In fact, the photographer determines to experiment further, and I should like to give him a few hints how to go about it.

Do not begin with a spoiled print; it is discouraging and is no fair trial, but find one with good modeling on the face, neither too light nor too dark, and with a fairly sharp focus. Of course, the print should be mounted.

When it is pinned firmly to a drawing-board, take a paint brush and wash the

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face over with plain water, being careful not to go beyond the edges; while this is drying, mix the color for the flesh (vermilion and yellow ochre), which should then be applied with a second brush, keeping the first one wet and quite ready to hand, for, as soon as the color is on, it is wanted immediately, to wipe out the whites of the eyes, soften the edges, take off any bulbs of color left on, and to generally improve things. In putting on a wash we must try and get back to our school days, and remember how we used to do maps, and how it was our aim to get an even color that kept discreetly in its own country and did not trespass unduly into the next. This applies exactly to the washes we put on the print.

The hair is done next. A wash of plain water is first put on, and then the color of the hair mixed and painted on as soon as the water wash has soaked in; then the edges are softened down with the other brush. Care must be taken that there is no distinct line left round any edge. With the color of the hair still on the brush, the eyebrows can be painted and the upper eyelid accentuated—the lower one should not be touched. Then the color is mixed for the eyes themselves and very carefully put in, so that the lights in them are not lost nor the expression altered. Now comes the most difficult piece of work for the beginner, the coloring of the cheeks and lips. The colors to be mixed are vermilion, carmine, or Indian red, and it must be put on as gently as possible, and the other brush—doubly necessary at this crisis—can soften the edges. The great thing, at this early stage, is to make the washes very weak, remembering that, though it is easy to add color to a platinotype print, it is a very difficult matter to take it away. Of course, with ivory it is different, but we have not got as far as ivory yet!

Perhaps now I have said enough to help the photographer to make a beginning in converting a photograph into a painted miniature. The only tools he requires so far are an ordinary paint-box of moist water-colors and a few sable-haired brushes of 2, 3, and 4 sizes.

After the first encouraging start comes the time for mistakes, and perhaps, before going further, I had better say a little on this subject. The most usual one is that color has been put on too strongly. I will take an example. A child is the subject. The complexion, hair, etc., have been washed in, and all looked going well, and then the red frock was colored, and directly everything else looked weak and washed out. The red was too vivid, and, as it were, overbalanced all the rest. An expert naturally would not make such a mistake; but supposing he had, he would correct it by deepening every other color in the print and by mixing such warm tones in his background that the red of the frock was worked up and so neutralized. However, as we are not experts, another method must be adopted, namely, by wetting the largest size brush, and wiping it carefully over the unlucky color. If this is done carefully and frequently, and the brush well rinsed in between, in time the color will be reduced; but under no circumstance must it be disguised by a layer of Chinese white, as this spoils the effect at once. Very often, in trying to render dark brown hair, we get too much color on to the print, and the lights and shades get hidden. If this is so, the quicker we get it off the better, because the difficulties in imitating these tones in paint are tremendous, and all our faking about is in vain; we only succeed in making the hair so unrealistic-looking that it resembles a mop or even a cap. We must remember to grasp every advantage the print gives us, and never to lose any of its suggestions by covering them with paint.

Another probable fault will be that our mouths have a hard, cut-out look, as if the lips had nothing at all to do with the face.

This can scarcely be called a mistake, because the mouth is one of the most difficult things to do, and I will try by a little explanation to smooth the way for the beginner.

In painting a mouth the photographer will have a chance in showing his kindly disposition, for the brush gives him the power of emphasizing faults or hiding

them; and so sensitive a feature is the mouth that the least little twist of the brush will do it. But if the miniature painter hopes for success, he must always beautify. The sitter must be seen at his or her very best. The mouth should be in the shape of a cupid's bow, and though a perfectly straight upper lip—fortunately one seldom sees it—cannot, and should not, be transformed by paint, yet the curves can very well be suggested and its straightness rendered less conspicuous. Also, there is no need to reproduce the exact color of the sitter's lips; the brush need not follow so strictly in the camera's steps of realism, and anemia is not recognized in miniatures! Let them be the healthy red of rose-madder or carmine mixed with vermilion. The upper lip has the least color, then a line of deeper red is drawn with a fine brush in a nice curved bow shape where the lips meet, and then the under lip is painted, if possible with the least color in its middle to suggest the round. At the corners of the mouth a little shadow of the weak gray should be put on most delicately. This has the effect of showing the mouth really does belong to the face, and gives the worker the chance of ignoring drooping corners, which so spoil a face's expression; and then, to finish, a faint gray shadow is touched in just under the under lip, unless it is already suggested in the print itself, and then the mouth is complete.

I would advise those photographers who are really feeling interested in converting their prints into miniatures to use a magnifying glass when painting the mouth. Even if they do not work with it, it will be found useful to see where the touches of the brush are too coarse and where more small touches are needed. I advise this more strongly because if the photographer—especially if he understands retouching—examines his work with a glass he will not be able to help adding the dots of paint that he sees are needed, and so he will be unconsciously teaching himself stippling—but I am anticipating, and must stop.

Before going further into the details of finishing the face, etc., of the minia-

ture, I should like to say a little about the background. It does almost as much for the painting as the glass when it is framed, which is quite as complimentary as a veil to a lady's face, bringing the whole of the picture together somehow, and softening any harsh effect. For painting in backgrounds the usual method is adopted: The surface is well washed over with a thick brush, given a few seconds for the moisture to soak in, and then the thickest brush is filled with the color desired, which is quickly put on, and with as few touches as possible. Three broad sweeps should be enough. What color depends, of course, on the worker's taste and the subject. But provided no very vivid color has been introduced, blue makes a very useful and safe background, and also suggests distance. It must be a pale wash, with just a suspicion of green to make it complementary to the complexion. My space is too limited to discuss dark backgrounds, and, as they are unusual, I can well let them alone, for if the print does not possess a light background, it must be vignetted. There is a rule, too, that the background must repeat every color in the picture, but this seems hardly necessary in our present stage, and some of the miniatures I noticed at the Paris Salon had just this simple background of pale, quiet blue.

Now to return to faces. Probably the photographer who has got so far is becoming more critical and ambitious about them, and, let us hope, the cold shadows of a platinotype print have begun to annoy him. He is quite right: these cold darks want warming up to look like flesh and blood; at present they detract from the natural look of the face. A correspondent has asked me, "Why do my faces look just washed over, and not painted?" and the answer is that the photographic look must be taken out of the shadows. A little light red must be used fairly dry on the brush, and put on to the darks, and wiped at once round with the second brush. Such distinct shadows as in the ear, round the nose, etc., should be worked over twice or three times to allow for the color sinking in.

Probably now the face has begun to look a little patchy, and requires some "mending up." Those who understand retouching will soon get into the way of using the brush instead of the pencil, and just spotting in the color where it is required, which in this kind of work is called stippling. For those who are not retouchers, let me just explain that stippling is putting in tiny touches with the brush just where there is a gap, and the color does not, as it were, join up. The surface must be made even, and for that reason little gaps and holes must be filled in. The marks of stippling should never show, any more than

those of retouching, and for this reason it is advisable to use a magnifying glass.

I do not recommend too much stippling; my idea is that the effect should be gained with washes and ordinary painting, and the stippling only used as a means to rectify faults. This is heresy, I know, but a photographic miniature whose surface is one mass of stippling has a mechanical look. Many workers put on their washes in a casual and haphazard manner, thinking the stippling will be a cloak for all their faults; but bad work, like murder, will out, and the result is an unpleasant effect.

VARIATIONS IN IRON-SILVER PRINTING¹



By JOHN MARTIN HAMMOND

THE iron-silver printing processes originated in about 1894, when Dr. W. W. J. Nicol, of Edinburgh, Scotland, announced the discovery of a printing method analogous to platinum, in which the salts of silver were used instead of the heavier metal. In the experiments of the inventor, and in its history, iron-silver printing, or "Kallitype" ("beautiful picture"), as Dr. Nicol enthusiastically called it, has closely paralleled the history of platinum printing.

The theory of platinum printing, as we all know, is the reduction of a platinum salt to metal in the presence of a ferrous salt in conjunction with a suitable salt of an alkali metal. The substances customarily employed in the process are iron oxalate, potassium oxalate and a double salt of platinum and potassium—potassium chloroplatinite.

If paper be washed with a solution of ferric oxalate, exposed to light under a negative and washed with potassium chloroplatinite and potassium oxalate, an image in metallic platinum will be

formed in those places in which the light has changed the oxalate from ferric to ferrous condition. This was the first practical method of obtaining prints in platinum, and was so patented by W. Willis in the later 'eighties. If, on the other hand, paper be washed with ferric oxalate and potassium chloroplatinite, and developed, after exposure, with potassium oxalate alone, an image identical with the first will be obtained; and this is the basis of all commercial platinum printing methods of the present day.

The history of iron-silver printing has been identical with that just outlined. Silver nitrate was first used in the developer, and was next associated with the sensitizing solution. There are several commercial varieties of this latter paper on the English market today. Until comparatively recently, there were a few on the American market. The paper is a cheap, rapid and reliable method of printing in silver, and its lack of popularity is to be ascribed, probably, to the general wane of favor which all sun-printing silver papers have suffered in recent years. At least, it may be said that the iron-silver processes give better results in beauty of tone and

¹A paper, before the Photographic Society of Philadelphia.

vigor of image than any other methods of "plain paper" silver printing.

The following is a summary of a series of experiments to determine the value of the various familiar methods of iron-silver printing. It will be well to start with silver in the developer and iron on the paper, alone, or with merely a trace of silver to make the image in printing more visible.

The best silver-developing formulæ are those of James Thomson. A summary of these with Mr. Thomson's notes is as follows:

FORMULA.		I	II	III	IV
Iron-ammonium citrate (grs.)	32	50	28	18	
Ferric oxalate	"	16	13	23	38
Cupric chloride	"	4	8	8	9
Potassium oxalate	"	33	35	35	36
Silver nitrate	"	10	16	19	18
Oxalic acid	"	10	16	15	16
Gum arabic	"	10	10	10	10
Citric acid	"	4	—	—	—
Potass. bichrom. (5% sol.) (drops)		10	5-10	5-10	5-10
Distilled water (oz.)		1	1	1	1

Solution I gives "black and white effects;" II gives "softer effects," III is "suitable for thin, flat negatives;" IV gives "fine gradation and delicate grays."

DEVELOPER.

Silver nitrate	40 gr.
Citric acid	10 gr.
Oxalic acid	8 gr.
Sodium phosphate	1½ gr.
Water	8 oz.

These formulæ can be depended upon to give the results stated. Their constituents are, however, a warring lot, the cupric chloride and silver nitrate being, on the face of it, irreconcilable in solution. I have found that the copper may be left out of the sensitizing solution and placed in the developer as cupric nitrate, and a quantity of citric acid may be substituted for the oxalic acid. The solution will then be clear after the addition of the silver nitrate. I have obtained a clear solution with the following formula:

Ammonium-iron citrate	25 gr.
Potassium oxalate	35 gr.
Citric acid	30 gr.
Ferric oxalate	15 gr.
Silver nitrate	5 gr.
Water	1 oz.

DEVELOPER.

Silver nitrate	40 gr.
Copper nitrate	20 gr.
Water	8 oz.

No great harm will be wrought by leaving out the copper altogether. Addition of acid to the developing solution is not absolutely essential unless the quantity of acid in the sensitizing solution is decreased.

For sepia tones, Mr. Thomson recommends a two-operation formula consisting of a salting solution of mercuric chloride and citric acid, followed by a bath very much resembling his formula I with the copper left out.

The following one-part formula will, in my opinion, give results just as good:

Ammonium-iron citrate (brown)	34 gr.
Ferric oxalate	15 gr.
Potassium citrate	50 gr.
Citric acid	40 gr.
Mercuric nitrate	4 gr.
Silver nitrate	8 gr.
Water	1 oz.

Increase of mercury gives warmer tones. Development is with the silver developer.

A very simple silver-in-the-developer paper I have found may be made with the following solution:

Iron-sodium oxalate	600 gr.
Four per cent. solution potassium oxalate	3½ oz.

This gives great gradation of tone with good black. Contrast may be obtained by addition of a few drops of bichromate solution (potassium, sodium, or ammonium) as ordinarily used by all gum printers. The solution will keep for a long time if pure water be used in its manufacture. *En passant*, do not dissolve ferric oxalate in hot water.

Prints made by any of the foregoing formulas should be fixed in a 2 per cent. hypo and washed for fifteen or twenty minutes before drying.

This brings us, naturally, to consideration of the silver-in-the-sensitizer papers. These will be preferred, no doubt, by many workers. The simplest of all formulæ of this description is that

published by Dr. Nicol in his original patent papers. It is:

Ferric oxalate	75 gr.
Silver nitrate	30 gr.
Water	1 oz.

For black tones the developer is:

Sodium acetate	1 oz.
Citric acid	30 gr.
Water	7½ oz.

For brown tones:

Sodium-potassium tartrate	1 oz.
Water	20 oz.

Bichromate solution is used as a restrainer and to give contrast.

Prints made by this formula need to be cleared after developing. For this purpose a 5 per cent. solution of citric acid or 10 per cent. solution of potassium oxalate is efficient. Fixing is with hypo, 5 per cent. solution. Washing must be thorough.

Another excellent formula—and a more recent formula—has been devised by Robert Hall. It is:

Solution A.

20 per cent. solution of ferric oxalate.

Solution B.

1 to 16 solution ferric-potassium oxalate.

Solution C.

Oxalic acid	240 gr.
Ammonia (0.880)	100 min.
Water	4 oz.

Solution D.

1 to 16 solution potassium-bichromate.

For normal negatives take:

A	1 oz.
B	½ oz.
C	30 min.
D	4 drops
Silver nitrate	36 gr.

Stir vigorously while the silver nitrate is dissolving:

It will be found that any of the formulæ for home-made platinum papers can be modified to iron-silver purposes by substituting for the standard 1 to 6 potassium chloroplatinite solution a solution of silver nitrate made of 1 part

of the silver salt to 12 parts of water. This opens a wide field for experiment of an investigatory nature.

Hübl's formula for cold-bath platinum paper is as follows:

Solution A. 20 per cent. solution of ferric oxalate, with 1 to 2 per cent. oxalic acid.

Solution B. The above plus 1 per cent. lead oxalate.

Solution C. 1 to 6 solution of potassium chloroplatinite.

For sensitizing for black tones take:

Solution B	4½ parts
Solution C	3 parts

If, now, a 1 to 12 solution of silver nitrate be substituted for solution C in this formula, and the paper developed in any of the standard black-tone platinum baths, a pleasing deep-brown print with pure whites will be the result.

The great difficulty with these silver-in-the-sensitizer papers is to obtain good black tones. If mercuric nitrate be added to the sensitizing solution, in the proportion of about four grains of this salt to twenty-five grains of silver nitrate used, no trouble at all will be found in obtaining these shades. This fact, though surprising as regarded in the light of mercury's well-known behavior with platinum developing papers, I have found to be none the less true. It has also formed the basis of a recent English patent.

Generally speaking, the iron-silver processes are simple in operation and comparatively certain of result. They are more easy and certain than gum-bichromate printing, and are to be recommended as a fascinating field of experiment for all photographers interested in the more scientific side of their hobby.

The number of tones possible with these papers is almost endless. Iron-sodium oxalate paper, washed with silver, gives a beautiful steel-black. Containing silver in the sensitizer, it gives a reddish-brown. Generally speaking, the more concentrated the developer with the silver-in-the-sensitizer papers, the warmer the tone.



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ORTHOCHROMATIC PHOTOGRAPHY¹

By ALVIN LANGDON COBURN, F.R.P.S.

ONE of the most useful things about preparing a paper on a particular subject is that it becomes necessary to examine one's own mind with the idea of gaining a definite viewpoint. It is impossible to explain to another a subject with which one has not at least a "speaking acquaintance."

When Dr. Swan asked me to collaborate with him on the subject of orthochromatic photography I at once agreed to do so with the very greatest pleasure, firstly because he is such a very persuasive person that it is almost impossible to refuse him a request, and secondly because I was sure that in his company I would acquire much useful knowledge. So after due deliberation it was agreed that he should present to you the practical side of the process, and that I should just jot down a few notes regarding the use of films and screens as they have occurred in my work.

Writers on the subject of orthochromatic photography lay particular stress on the fact that with a color-sensitive plate and screen a truer rendering is obtained, but they are not always very explicit as to whether they mean visual truth or artistic truth! The eyesight of each human being varies slightly, in the same way that the artistic development and sense of appreciation is different in each of us; therefore it is almost as difficult to say exactly what is visual truth as it is to decide what is artistic truth; each must make his own laws in art. And so the question as to whether orthochromatic photography is more truthful or not than the older non-color-sensitive variety is, to the pictorial photographer, not so important as the fact that it may be more dramatic, or that it may place in his hands a method of obtaining new and interesting effects quite apart from anything so mundane as an absolutely literal translation of nature. It seems to me

a big field, and I have only touched on the outer fringes of it, but why should we not have a series of, say, seven or eight screens of various colors for the avowed purpose of producing effects as unnatural as possible. If by this means we could translate Kensington Gardens into fairyland, would we not be the gainers thereby?

The ordinary plate is to a certain extent color-blind, but this is not always a disadvantage, for by its judicious use in certain circumstances we may be able to obtain a more telling result. In my own practice I almost always use orthochromatic films, but not always with a screen. For over fifteen years I have hardly exposed a plate. There are plenty of good reliable color-sensitive films on the market, and I have used most of the varieties at one time or another; we may even have some day a panchromatic film!

Color-blindness in a human being, I have been told, results in a grayness of vision, but a grayness of very subtle differentiation. My friend, Mr. Henry Smith, the inventor of the Smith semi-achromatic lens, and an optical thinker of rare originality, once told me that he had been able in a number of instances to teach color-blind people to distinguish colors and name them with precision, simply from their tonal values. Now the artist-photographer who wishes to really approach his subject with intelligence must reverse the process and acquire a sort of artificial color-blindness in order to realize what his result is to be like when translated into tone. Looking through a piece of tinted glass may help him at first, but the ability to "see in monochrome" is an accomplishment not to be despised. Further than this, he must know which combination of plate and screen (or absence of screen) will give him the most interesting result, with a given subject and lighting. Text-books on orthochromatic photography will help the beginner in this field, but practical experience is the best teacher,

¹A paper read before the Royal Photographic Society of Great Britain.

and soon the student on looking at a landscape will be able to say: "Yes, that should have a pale yellow screen, or a deep yellow screen, or a graduated screen!" This last is one of the most fascinating of aids to the cloud photographer, as it enables him to get printable foregrounds and cloudscapes on the same negative. As its name implies, it is deeper in color at one end than at the other, so that the upper or sky portion is simultaneously held back and

right screen and exposure, able to concentrate your interest in a variety of ways, and a judicious choice may change an at first dull arrangement into one of quite unique charm.

With a fast lens (I use one working at $f/3$ much of the time) the slight additional exposure required with a pale yellow screen is not excessive, particularly with such subjects as clouds, water, or distant landscape, where the exposure in any case is luckily short. I find an exposure meter a great help and comfort, for photography at best is fraught with a certain amount of uncertainty which it seems foolish to needlessly increase.

Dr. Swan insisted that I should say something about portraiture. Now I am not going to tell you the story about



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corrected. The most satisfactory screens of this sort which I have used are those made by Sanger Shepherd. They are held in a fitting which slips over the lens mount, and are able to slide up or down to account for a high or low horizon or a greater or lesser depth of correction. Most of the cloud slides of mine, which you will see presently, were made with this extremely useful screen, fitted on a reflex type of camera; it is thus quite easy to tell the exact amount of correction required by consulting the ground glass.

One of the great advantages of orthochromatic photography seems to me to be that by its aid you are able to compose your color values. Quite apart from any question of subject-matter, you are, with the proper use of just the



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the red-headed girl with freckles and the necessity of a panchromatic plate, because you probably all know it, but I want to say that in portrait work I think there is absolutely no question but that a color-sensitive plate is a very great help in rendering skin textures. The day has gone by when indifferent photography will be tolerated by those who know; we must keep up with the times, and use every device that science invents for us if it gives us an added

power. It is said by the text-books that orthochromatic photography makes less retouching necessary, but I would go further than that and say that, with a proper lens of the soft focus type, color-sensitive plates, and a judicious use of lighting, absolutely no retouching is necessary; but then, perhaps, I would be considered an extremist in this matter, for to me any sort of retouching is



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repulsive and degrading! A man spends his whole life acquiring a face full of nice interesting wrinkles, showing his character, as a relief map shows the character of the country it represents; and then the retoucher, who may never even have seen the sitter, laboriously and painfully "works them out," giving to each person a complexion resembling nothing more than a hard-boiled egg!

Very few portrait photographers use a screen except in unusual circumstances, owing to the added exposure. In my

own studio the walls and carpets are a sort of light yellow-brown, and this reflects on the sitter in such a way that a screen is almost unnecessary. But out-of-door portraiture is another thing, and here one may almost always use a screen to advantage. It seems to me that out-of-door portraiture is a much neglected field. Who has not been told of wonderfully successful snapshot portraits taken at unexpected moments by inexperienced amateurs? People who are excessively "camera conscious" are only to be satisfactorily perpetuated in this happy manner, and under a tree, Nature's own studio, with a screen and orthochromatic plates, it is possible to obtain the most satisfactory results.

It is to cloud photography, however, that we turn for the most spectacular demonstration of the use of color-sensitive plates. Who of us has not sought and admired a cumulous cloud as one of Nature's masterpieces? It is full of romances, of landscapes, of dreams. It is far enough away, so that only an aëroplane or a mountain top can profane it by physical contact, and yet we are able to ensnare it with our process. Perhaps the transcription, or any art transcription for that matter, will be a little like a gramophone rendering of a human voice, as compared with the original—you will always hear the scratching of the needle—but as we cannot always be hearing Chaliapine or Caruso sing, so also it is not always that we have an opportunity of admiring the "towering monsters of the sky." So we must "put something by for a rainy day," and it is here that methods of reproduction have their use; but it is always well to realize that they are not the "real thing." Life is the greatest of the arts, and no amount of screens and color-sensitive plates can produce the same sensation as being face to face with reality.



PRACTICAL PAPERS ON STUDIO WORK AND METHODS

Inexpensive Decoration

AFTER a long and dreary winter, we are now on the threshold of summer, and the brighter days that we hope are at hand will make many studios and reception-rooms look very dingy. We may have been postponing re-decoration until after the war, but peace is not yet in sight, and yet we cannot possibly delay the necessary renovations, if we are to retain the respect of our patrons. Labor is scarce, and likely to be scarcer, so that in the majority of cases we must do the work ourselves, and to the photographer who has the reputation of being a handy man, there should be no insuperable difficulties.

The principal stumbling-block is that of obtaining suitable materials in a convenient form, but this can easily be surmounted by the exercise of a little common sense. One necessary preliminary is the acquirement of a suitable over-all to work in. A long coat, called by painters a "slop," or a boiler-suit as used for motor and other engineering work will serve to keep one's clothes clean and to allow a freedom in working which is impossible if one has to consider the possibility of getting paint or distemper on a serviceable suit. Moreover, such an overall can be instantly doffed, leaving the wearer ready for immediate attendance upon a customer.

The necessary materials for a thorough brightening-up may be said to comprise distemper, paint, enamel, wall-paper, furniture-polish and leather reviver, and we will deal briefly with the preparation and application of each of these.

Distemper, in its white form, is usually known as "whitewash," and is rarely used for anything but ceilings. By the addition of various colors to the whiting used as a base many different tints may be made, while for darker colors the pigment is used without any admixture of white.

The first step is to obtain a clean pail, either galvanized iron or wood, and into this to break up one or more "loaves" of whiting, mixing this with water to the consistency of a thick cream, and carefully breaking up all lumps. Into this is poured melted size, in the proportion

of one pound to each "loaf" of whiting. The mixture is well stirred and allowed to set. As a general rule distemper so made has a slightly yellowish tinge, to remove which it is advisable to add a little blue. This is best done before adding the size, by squeezing the domestic blue-bag on to the whiting until the mixture is decidedly blue; when dry it will be white. About half an ounce of common alum dissolved in hot water and added to the size will "tan" the coating and make it more or less waterproof. Various colors may be added for walls, and these are best mixed with the dry whiting. Burnt umber gives a pinkish tinge. Venetian red a terra-cotta, Vandyke brown, buff to dark oak color, and Brunswick green pale to full green. A little lamp-black may be added to give a gray tint to any of these, but should not be used dry; it should be obtained "ground in water." For fine work the distemper, when it has cooled to a thin jelly, should be squeezed through butter muslin, to prevent the occurrence of streaks, which arise from particles of unmixed color. For large surfaces a flat distemper-brush should be used, but for small ones ordinary paint-brushes answer well. The color should be stiff enough not to run down the handle of the brush when working on a ceiling. For walls, a better surface may be got by stippling with a "dry" brush, as is done with oil color. One point to be remembered is that distemper colors dry much lighter than they appear when wet, a dark oak when wet drying to a buff. Before beginning work a smear of the color should be put on a bit of brown paper and dried at the fire to get the true value. Distemper may be applied over ordinary wall-paper, canvas, wood, or almost any surface. If applied *thinly* over faded areas cloth or canvas it will hardly alter the surface; of course, in this case approximately the original color of the cloth should be used. There are many ready-made distempers which require only the addition of water to be ready for use, but, as a rule, they are more sloppy in handling and not so durable as color made as just directed.

Doors, window-frames, and skirtings should

not be distempered but painted in oil, and it is better to buy the paint in tins or to get an oilman to mix it. If a special shade be desired, any oil and colorman worthy of the name will mix it. Woodwork should be washed with Hudson's or with sugar soap and well rinsed and dried before painting. Enamels are paints mixed with varnish and generally dry with a glossy surface. They are excellent for a finishing coat for inside work. One should not be tempted to thin down paint to a very fluid consistency. It cannot be laid on so evenly, and is more likely to rub and spread where it is not wanted. When painting surfaces adjoining wall-paper or distemper, as on the upright styles holding arras cloth or the edges of a door-frame, it is a good plan to hold a flat zinc plate as a protection, moving it along as the work proceeds. An old 10 by 8 or 12 by 10 dark-slide partition answers admirably; failing this, an ordinary stiff mount answers well, but does not keep such a clean edge. If a matt surface be desired, it may be obtained by stippling with the end of a dry brush. Thinning with turpentine alone tends to give a dull surface, while linsced oil and turpentine give a glossy one. To hasten the drying of oil paint, a little patent drier may be added. This oxidizes the oil more quickly: it should be used sparingly with light colors, as it is yellowish in tone.

Wall-paper is not difficult to hang if the paste is properly made. The proper way is to mix *cheap* wheaten flour to a cream, with cold water, and then to pour on boiling water until the mixture thickens, just as when making starch paste. The paper should be plentifully coated, and then folded on itself, paste inside, for a minute or two. This allows of even expansion, and there is much less chance of blisters and creases if this course be adopted.

Polished woodwork may be cleaned and the surface revived by using a good polish. "Revivers," which are really thin varnishes, should be avoided, as they are apt to go smeary and cloudy. In default of a ready-made polish, a little vinegar and salad oil mixed in a saucer, rubbed well on with a flannel and polished off with a clean rag, will move dirt and leave a good non-sticky surface. It is excellent for the black grime often seen on studio cameras and stands.

Carpets may be cleaned without removing from the floor, by a preliminary treatment with a vacuum cleaner. Then a gill of oxgall is mixed with about half a gallon of water, and applied with a soft scrubbing-brush until it lathers. The coating is then sponged off with clean water and rubbed with a duster until nearly dry. This has a wonderful effect in brightening the colors.—*British Journal of Photography*.

Prices and Cost Prices

In the vast majority of cases photography can no longer be considered in the light of a profession in which the fees have no appreciable proportion to the cost of materials used, but a business in which the cost of production of the finished article has to be carefully considered. In most manufacturing establishments there is a system of cost sheets in which the exact expenditure for labor and material is shown for each

batch of articles, a certain proportion being added to cover standing charges of rent, rates, gas, supervision and other incidental expenses. In this way a check is kept upon what is called "factory cost," and it is the aim of every manager worthy of the name to reduce this to a minimum by preventing waste of time and material and seeing that all effort is turned to profitable account. It is, however, obvious that such a system cannot be applied to an ordinary photographic business, and the proprietor or manager who wishes to know what his pictures are costing must begin with the finished article and work backward, finding out first his output in various sizes for the year, and then the cost of materials and labor for producing them. In many manufacturing businesses it is the custom to add to the sum thus obtained an equal amount to cover the running expenses of the business, such as rent, light, fuel, rates and taxes, advertising, and clerical or reception-room expenses. This will give a fairly accurate estimate of cost in most cases, but when the rent is a high one and the non-productive staff fairly large, it is better to work upon the actual outlay and to put down a margin of, say, ten per cent. to allow for any accidental omissions. From our knowledge of photographic businesses, we are prepared to say that very few photographers can tell what their annual production of photographs in numbers comes to—that is to say, to give a classified statement of the quantities of cabinets, cartes, enlargements, and other work sent out during the year, and still less can they tell what they have cost.

No greater mistake can be made in conducting a photographic business than to have an "advertising line" upon which there is a very narrow margin of profit; it will have been noticed by those who study such things that a firm which adopts this course is usually upon its last legs. Photography cannot be compared to drapery. Customers who come to a studio for the cheap line cannot be persuaded into additional expenditure, and those who have supported the better class of business are more likely to drop to the lower level, or to go elsewhere. It has been the practice of most of our successful men to make every transaction a paying one in itself, and not to trust merely to making the business pay as a whole. In this connection we may mention the vexed matter of free sittings. Many photographers give these, and some find them more or less remunerative. On the other hand, they often absorb a goodly proportion of the profit from better paying business. It may be said that this can easily be detected, but it is not so unless there is careful supervision and accurate bookkeeping. The orders from complimentary sittings may cover the cost of all the material used, but if they were absent, it is possible that what we may call the legitimate business of the studio could be done with a smaller staff. Parsimony or niggardliness is out of place in a photographic business, but thrift and economy are not. Our advice is to use good materials, pay fair wages, but see that there is no waste of either time or money, and that a fair relationship is maintained between the cost and selling prices of every line issued.—*British Journal of Photography*.



Your Big Opportunity

FOR weeks and months to come there will be thousands and hundreds of thousands of men all over this great land who will enlist in the army and navy. In their new uniforms they will want photographs for members of the family, relatives and friends. And in turn the soldier or sailor will want pictures of the folks at home for *his* kit. All this means increased demand for real service and real profits *for you*. It will be necessary to resort to artificial light—to work late and hard—like our English cousins, whom we understand have had to close their studios, in many instances, in order to catch up with orders. Don't you see this big opportunity coming to you? Prepare for it without delay and be thankful. "A word to the wise is sufficient."

The Value of a Holiday

Do you ever take a day or two off and visit other studios in your city or neighboring town? If not, you had better arrange to do so *soon*.

There are things being done, methods being used every day, that are so simple and effective as to be almost self-evident to the initiated, yet which are not being used in places where the employment would help wonderfully. Things—new ideas—must be *seen* and the principles applied, perhaps with additions and modifications in *your* own studio, to be helpful and profitable where the help is most needed.

Let us urge you to visit your brother photographer. Tell him what *you* are doing. You may be able to eliminate the feeling that *he* can succeed and make money any old way. Then, too, you may get a suggestion that will make an order a welcome one and profitable when heretofore it has always come out on the wrong side of the balance sheet. Just visit around, grasp ideas, and the good fellowship will more than repay you. Listen to what John H. Garo, master photographer, advises:

"Go out of doors for inspiration, then you can find the immense and varied nature in all its different moods. There is where your soul can feed and expand. For a time, close your studio behind you. Above all, when you return, be sure that there is a bit of sunlight in your soul and some ambition in your heart."

Advertised Goods

THERE are quite a number who have expressed their opinion that the manufacturers of photographic goods were not aiding the photographers by doing so much advertising. They say they think the photographer would make more money selling the goods that are not advertised and that national advertising of photographic goods prevents the photographer selling the goods which he would like to sell in many cases, and on which he could make more money. This last remark made us sit up and take notice, for if there is anything in the world that is helping the photographic business today, it is the national advertising of the manufacturers. If this should be stopped immediately, business would go back so rapidly that photographers would find it impossible to pay rent, stock or living expenses.

Advertising of any kind of anything connected with the photographic business is a help to that business. The more the public think of photographs, photographic apparatus, kodaks, cameras, etc., the more pictures are going to be taken and the more pictures there are taken the better chances you have of getting part of the money.

Any article on which the manufacturers spend large sums of money to advertise is sure to be worth the price asked for it, and you can guarantee it to any of your customers.

By advertising he is making more people think of photographs, pictures, mountings, how pictures are made, etc., and all of this helps the business.

We all have old customers, but it is the new customers which we want, and the advertising of the manufacturers brings the new customers into your studio, for they can afford to advertise in a way that will be convincing. The more people who have their portrait taken in your studio, the more portraits they are going to want.

The more of your pictures which are around in the homes of your city, the more there are going to be, and the photographer who coöperates with the manufacturers and the dealer who advertises and who sells advertised goods, who can show to his customers the large monthlies and weeklies in which they are adver-

tised, is the man who is going to have satisfied customers when they leave his studio.

It is easier to sell advertised goods, it takes less time, therefore the profit is greater, even if you pay more for them.

Supposing there are three or four galleries in the city, supposing they are all using the same mount or folder, just the same as they all use the same camera or lens, if one can do a better job than the other, if one has more artistic taste, if he can deliver service where the others cannot, he is going to get the business, and you cannot stop him by having a special design of mount or folder. Your customers do not come back to your studio because you have this special design.

Supposing the whole bunch of photographers in the United States could get together for an advertising campaign. Why, they could not afford to spend one-eighth or one-sixteenth of what the manufacturers are spending.

Sell advertised goods and when a customer comes into your studio and does not ask for any particular kind, be sure and show him advertised goods, because sometimes afterward he will see the advertisement and he will know that the goods which you sold him were right.

Then again, when a customer sees an advertisement and reads it, you do not have to talk as much and you do not have to use as much time to sell him; sales talk isn't necessary because the customer knows what he is coming after.

The larger the manufacturer and the more he advertises, the bigger business for the dealer and the photographer, and the manufacturer who advertises is doing more to increase your sales, in many cases, than you are doing yourself, and just as long as he advertises and you co-operate with him in every way possible, your business is going to increase.—*Ohio Photo News*.

Big Convention for Missouri, Kansas, Nebraska and Oklahoma Photographers

THERE is going to be one of the biggest and best conventions from a photographic standpoint held in Kansas City, Mo., July 17 to 21, that has ever been seen west of the Mississippi River. It will be four days of something doing all the time. The best of everything is in store for you, nothing having been overlooked. The model studio will be built on the largest scale ever attempted by any association and will be run under the management of Daddy Lively, who you all know made a howling success at Lincoln, Neb., last year. The talent for both the lectures and studio will be of the best. You can't afford to miss this opportunity, and remember we have a reason for your coming. With the help of all we will put across a gathering this year that will place us first in convention ranks. Lay your plans now and don't forget the date and place—July 17 to 21, Kansas City, Mo., Convention Hall.

Have you secured membership in the Missouri Valley Association? If not, send your name, address and \$2.00 to Harry Pottenger, Secretary, Wichita, Kans. We are out for 1000 members this year. Help the cause.

Death of Addin Colwell Lane

ADDIN COLWELL LANE, artist, inventor, and photographer, died on May 3, at Spring Lake, after a long and severe illness. For years Mr. Lane had suffered from chronic myocarditis, yet such was his love for his profession that it was not until two years ago that he retired from active business.

He was a New Jersey boy, a descendant from one of the oldest Colonial families, but in early life went to New York to study art at Cooper Union. He had genius and a capacity for hard work, and rapidly won respect for his efforts. Although he spent some time in Philadelphia, where he practised photography and did important work in developing the use of the then famous wet plate, Mr. Lane spent the greater part of his life in New York City. At one time he was associated with the Pach photographers, and travelled extensively for them among the colleges of the country, where he photographed thousands of students and men of distinction. For twenty-five years Mr. Lane practised photography in Brooklyn, and for a long time was its leading man in portraiture. He maintained two establishments at one time, and attracted to his studios not only the élite of the city, but sitters from distant places. He exhibited pictures at the Brooklyn Institute of Arts and Sciences, at cities in the West, and at numerous conventions and fairs. He was awarded several gold medals for his work. In color photography Mr. Lane achieved a remarkable success, and he was recognized in the profession as a master in the delicate art of negative modeling. He was a sincere artist. This was shown in his posing and lighting effects. His own words reveal the spirit of his work: "A picture must portray the soul of its subject—it must have a language. Art is expressive, not mechanical." His ideal was to elevate the artist profession, and he always preached the brotherhood of its members. The "Old Guard" in photography revered Mr. Lane's ability, and generously called him "the best photographer in the United States," while he was equally generous in praise of the rising men of the "new photography."

Mr. Lane was versatile. He invented a number of improvements for photographic apparatus, few of which he was interested in commercially, but at the time of his final breakdown he was at work on a lens which he intended to put before the optical manufacturers.

Private services were held at Mr. Lane's late residence in Freehold, and he was laid to rest at Long Branch, N. J.

Eastman Portrait Films

A NEW and revised edition of the pamphlet on the use of portrait films has just been issued. The manipulation and proper storage of film is very carefully described and the professional should not fail to get hold of a copy from his dealer, whether he now uses film or not.

The New "Harvey Exposure Meter"

On the No. 2 Harvey exposure meter, just put on the market, exposures are given for $\frac{1}{25}$, $\frac{1}{30}$, $\frac{1}{40}$ second, as well as all other exposures for Graflex cameras, kodaks, motion picture, Cirkut and other cameras. The first meter gave $\frac{1}{20}$, $\frac{1}{30}$, $\frac{1}{40}$, etc. The No. 2 Harvey exposure meter now has kodak stops 1, 2, 3 (4), in addition to the U. S. and f stop system. The classification of subjects also is quite different from the first meter. Some of the exposures are faster, some are slower and many are just the same as on the first meter.

Since making the first meter, Mr. Harvey has devoted a year's time to making thousands of additional tests in various parts of the country, in order to check up the exposures given on the No. 2 meter.

There is given the relative speed for 20 different plates and films, so that if one wishes to take a picture on any plate of one of the subjects given, he can see the relative speed of his plate. For the use of other plates, the plate speed circular shows the Hurter & Driffield number to be used on the meter.

Mr. Harvey has made a most thorough and careful test in determining the plate speed and use of standard developers.

He believes amateurs would be wise to follow the instructions given by manufacturers of plates in developing, as the manufacturer knows just what is in the plate and should know the best developer for it, as he spent his lifetime and had experts working on the proposition, and it is natural he would publish the best possible developer he knows for the particular plate he is offering.

For those who develop in tanks, he calls particular attention to the importance of having the temperature of the developer correct. A change of two or three degrees in developer temperature will seriously affect the length of time required for development.

Circular No. 11 is more extensive than heretofore and gives many suggestions to amateurs on the exposure question.

It is economy for an amateur to have a good exposure meter, and he will derive much more pleasure from photography if he has good pictures instead of blanks. We thoroughly recommend this new No. 2 meter. Further particulars can be had by writing G. L. Harvey, 105 S. Dearborn Street, Chicago, Ill.

The Secret of Success

THE secret of success is not a secret. Nor is it something new. Nor is it something hard to secure. To become more successful, become more efficient. Do the little things better. So work that you will require less supervision. The least supervision is needed by the person who makes the fewest mistakes. Do what you can do and what you should do for the institution for which you are working, and do it in the right way, and the size of your income will take care of itself. Let your aim ever be to better the work you are doing. But remember always that you cannot better the work you are doing without bettering yourself. The thoughts

that you think, the words that you speak, and the deeds you perform are making you either better or worse. Realize with Henley that you are the master of your fate and the captain of your soul. You can be what you will to be. Forget yourself in rendering service to others. If an employee, strive to make yourself of greater value to your employer. Look upon yourself as a manufacturer. Think of yourself as being in business for yourself. Regard yourself as a maker and seller of service, and ever bend your thought and your energies toward the improvement of your product. The wise manufacturer never injures his machinery willfully. Your body, your mind, your soul serve as your plant. Eat and drink only that which will nourish your body, entertain only those thoughts that will enrich your mind, and if you feed your body with the best physical food and your mind with the best mental food you will build up a service factory that will find its products in constant demand. The world is hungry for quality service. It wants to pay for it. It is paying for all it can get. The market is not crowded. There is a chance for you right now. There is a chance for you right where you are. The time to start is now. Your reward will take care of itself.—*Printing Art.*

The Auto Fixt-focus Camera

THIS exceptionally fine, small pocket camera is enjoying increased popularity, and the new prices of forty and fifty dollars are certainly meeting with the approval of the purchasers. This camera is now being equipped with the well-known Wollensak Velostigmat lenses in two speeds which adds materially to its popularity. As the reader no doubt knows, this camera embodies a very simple mechanism which permits of the quickest possible setting of the focus before the camera is opened, and furthermore, as the camera is opened, the front moves automatically to the desired point, where it locks. Room does not permit our going into detail as to all the desirable features of this new camera, but the reader is advised to write for a descriptive booklet being sent out by the manufacturers, Herbert & Huesgen Company, 18 East Forty-second Street, New York.

Minutes of the Meeting of the Federal Photographic Society, held at the New Ebbitt Hotel, Washington, May 11, 1917.

MEETING called order by the president.

Minutes of the meeting of March 30, 1917, read and duly adopted. Correspondence from the PHOTOGRAPHIC JOURNAL OF AMERICA, the War Department, and Mr. H. T. Cowling, read.

The addresses of those members present were corrected to date. Mr. E. S. Shipp and Mr. A. Ludwig were nominated for the office of president.

The president appointed Mr. A. J. Olmstead and Mr. L. W. Beeson as tellers. Mr. Ludwig was duly elected.

Mr. Shipp was nominated as First Vice-President, and unanimously elected.

Mr. Beeson and Mr. Linsenmeyer were nomi-

nated for Second Vice-President. Mr. Beeson was duly elected.

Mr. E. L. Crandall was nominated as Corresponding and Recording Secretary and unanimously elected.

Mr. A. J. Olmstead and Mr. A. A. Ruark were nominated for Treasurer. Mr. Olmstead was duly elected.

Mr. Carl Oswals and Mr. C. O. Buckingham were nominated as associate members of the board of directors. Mr. Oswals withdrew and Mr. Buckingham was unanimously elected.

Mr. Linsenmeyer and Mr. Stenhouse were unanimously elected as active members of the board of directors.

Meeting adjourned.

R. C. TRAVER,
Secretary *pro tem*.

At a meeting of the Federal Photographic Society, held at the New Ebbit Hotel, Friday evening, May 11, 1917, the following officers were elected for the coming year:

Mr. Anthony Ludwig, Department of Agriculture, President.

Mr. E. S. Shipp, Forest Service, First Vice-President.

Mr. Boring W. Beeson, Smithsonian Institution, Second Vice-President (an honorary office).

Mr. E. L. Crandall, Department of Agriculture, Secretary.

Mr. A. J. Olmstead, Department of Agriculture, Treasurer.

Mr. C. O. Buckingham, Government Printing Office (associate member); Mr. A. H. Linsenmeyer, Geological Survey, and Mr. Walter Stenhouse, Smithsonian Institution (active members) were elected to serve on the board of directors.

After the election of officers a buffet luncheon was served, during which a general discussion of color photography was carried on.

Mr. George Powell, finger-print expert at Marine Corps Headquarters, Mr. Earl J. Albright, Enlistment Division, Marine Corps Headquarters, Mr. Carl P. Winther, member of the staff of operators of the Prizma Corporation of New York, and Mr. Hal G. Hall, of California, recently appointed photographer in the Division of Illustrations, Department of Agriculture, attended the meeting and luncheon as guests of the society.

The new officers have announced their intention of at once beginning the preparation of an interesting program for the coming year and of carrying on an active membership campaign.

Dealers and Photographers, Attention!

In buying and selling second-hand photographic lenses, it is advisable to use the utmost care in order to make sure that the lens is genuine. It is a well-known fact that in many instances lenses are being sold as the product of some reliable manufacturer, while, as a matter of fact, the lenses have been replaced by cheap rectilinear or by even an absolutely worthless piece of glass, the original cells of the manufacturer being made use of to deceive the buyer. If a lens is not bought from a

reliable dealer it is always advisable to submit the same to the manufacturer for test, which tests are generally made free of charge.

A specific case of this kind has just been brought to our attention by the C. P. Goerz American Optical Company, of New York.

A lens bearing the engraving Goerz, Series 3, No. 7, 14 inches focus No. 43711, was brought to them with the complaint that the lens was not working satisfactorily, and upon test the lens was found to be a counterfeit of the worst kind, and we would therefore urge all dealers and photographers to be on their guard. Someone had taken the mounting of a Goerz Series 3, No. 7 lens and placed an absolutely worthless piece of glass in same, palming this off as a high-grade anastigmat.

Prices and Business

A DISCUSSION of price conditions is not as exciting as was the case a year ago, but it has its points of interest just the same, and the difference is of degree rather than character. The latest advances have been in the line of apparatus, and there have been some decidedly sharp increases in prices. These increases have been most noticeable in portrait cameras and stands. View cameras have advanced about 10 per cent. and sundry apparatus like printers, enlarging apparatus, etc.

The lens situation is precarious but still unchanged. Bausch & Lomb announce that they are now manufacturing optical glass of several different grades and turning it out in sufficient quantity to supply the average demand for the lenses most frequently used. The grades used in some photo-engraving lenses and some types for technical purposes they have not perfected. Also they are not prepared to make glass in large enough sizes to make condensing lenses of nine inches or more. Other lens manufacturers are still able to supply instruments, but state that they are not at all certain as to when they will lack a supply of crude optical glass and be compelled to discontinue certain types. The catalogue prices have not been changed by any of the lens manufacturers, but the discount has been lowered a little, which is virtually an advance in price.

Plates and papers still continue at the same schedule, and no news has reached us as to probable future conditions one way or the other. If a change comes, it will come without warning, so that there is not likely to be any opportunity to anticipate it.

Chemicals are fluctuating slightly, there having been a slight hardening of prices in pyro and hydrochinon during the past month. Permanganate of potash has had a flurry, and for some reason that we cannot explain has become scarce. Some manufacturers state that they are out and cannot supply until further notice. Others quote an advanced price and limited supply. Bromide of potash has advanced very slightly, but most dealers have not changed the retail price, as so many changes are confusing, and unless there is a sharp change they prefer to be satisfied with a reduced profit.

The coal-tar developers are coming along

nically. A little item of interest is the proposal to open to American manufacturers patents on articles that they have heretofore not made because of these patents. It appears that many patents for chemicals, drugs and dyes are registered in the United States patent office, and, of course, they hold good under the international patent agreements. England and France have set a precedent for war times, and where an article is short and a manufacturer desires to make it under the German patent rights he must appear before a special court or commission and register his desire to manufacture this article and present costs of material and manufacture. If the court so decides, he will be allowed to go ahead and manufacture under a royalty, which he must pay over to the court at stated terms. At the end of the war, a settlement will be made with the German owners of the patents, and the royalties will be turned over to them and the manufacturer will be guaranteed free from suit for infringement.

It is supposed that the settlement of this action will be a part of the peace treaty when the war is over, and, of course, it is impossible to state what the final settlement will be. If, however, our Congress passes the law permitting this action, American manufacturers will have access to the formulæ and processes for making a number of articles that they have been experimenting with with more or less success.

It is very difficult to advise the trade of each revised price, for paper and printing are high, and it is impractical to get out new catalogues with each change, even if it were possible. In the matter of apparatus, the number of articles is great and the catalogues are out of date between the composition and the printing. Where purchasers are interested in the price, the dealer will be glad to make special quotations and offer the latest and lowest prices.

The old saw has it that "He who hesitates is lost," but we beg to differ with the wisdom of our forefathers, because we believe that because business has hesitated it has not become lost. A Canadian recently told of his experience when the war began. His business hesitated so strenuously that it went backward instead of forward, and instead of waiting for ruin to catch up with him, he felt himself backing up with increasing speed until he just shut his eyes and waited for the rear-end collision. But before ruin caught up with him, he became conscious that he had started a little movement of his own in the proper direction, and when he opened his eyes to what was going on he realized that he was going at a pace that would make ruin hump itself if it ever expected to catch up. That nightmare lasted some four months, and since then he has had to put on the brakes for fear of a hot box. He states that there is a limit to human endurance, and that it is against the etiquette of the country to raise prices to stop sales, so he has to limit the number of orders he can accept.

Some shrewd business experts are predicting

that in this country we will have somewhat the same experience, so we are inclined to preach patience and perseverance to carry us over the period of hesitation. We are not of those who feel that we will have to fight off business, but we do not feel pessimistic in the slightest degree, and the photographer who girds up his loins (if he has any) and works hard at his job will have no time to kick over business conditions due to the war.—*Trade News*.

A Notable Exhibit

UNDER the sanction of Bishop Greer, of the diocese of New York, the present condition and the proposed immediate extensions of the Cathedral of St. John the Divine were shown in the form of a model, with plans and drawings, by Cram & Ferguson, the architects; and in direct color photographs by Henrietta Hudson; and in monochromes by Roger B. Whitman, architectural and garden photographer; at Mr. Whitman's atelier, 14 West 40th Street, New York; June 11, 12, 13, 14 and 15.

This unique exhibit was attended with unusual interest. Mrs. Hudson's autochromes have a distinction of the finest and truest quality, which have won her universal acknowledgement as supreme master in direct color work, and we congratulate Mr. Whitman upon the remarkable results of his monochromes. Here is truly interior architectural photography at its best.

Liver of Sulphur Sepia Process

THE following we take from the September issue of *Portrait*.

In view of the constantly rising prices and increasing scarcity of potassium bromide and ferricyanide, I have been asked repeatedly, by those photographers who find it necessary to make their sepias by redevelopment, for a toning process which would replace that method.

I have found upon experimenting that the following formula of the old liver of sulphur process gives beautiful sepias and tones so quickly that by heating to the desired temperature, it can be used, eliminating the constant heat. Thus, we find it possible to use it for large prints (too large to be put into the hypo-alum bath), by heating the toner and pouring it over them in the trays. At from 90° to 100° F. this bath will tone a print of ordinary density in from three to five minutes, and produces a tone which I think preferable to those obtained by redevelopment.

The formula is as follows:

Water	1 gal.
Liver of sulphur	60 grs.
Stronger water of ammonia (28 per cent.)	3 drs.

PHIL. B. KEELER.

San Francisco, June 16, 1916.



CORRESPONDENCE

Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names & addresses of the writers are given. We do not undertake responsibility for the opinions expressed by our correspondents.



WORTH-WHILE LETTERS ON LIVE IDEAS

FROM OUR CONTRIBUTING EDITORS

Mounting and Finishing

TO THE EDITOR:

SIR: About two years since I was very much troubled with very fine scratches in burnishing, different from those caused by roughness of the burnishing tool. Another proof that the cause lay outside of the burnisher, was that two or three perhaps would burnish all right, then one scratched badly, next all right, and so on through the lot. I finally found the cause to be that the prints were allowed to get too dry before burnishing, and the remedy I used was as follows: After mounting, the moisture should not get out of the prints before burnishing. As soon as the prints begin to curl toward the picture, I pack them one upon another. My first plan was to place them in the cellar until ready to spot; while doing this I only expose one print at a time, keeping them packed. After spotting, lubricate with soap and alcohol (I find wax, spermaceti, etc., to give, in my experience, a veiled appearance), and spread out in the cellar upon something clean. I use a cloth stretched upon a small frame, where they should remain until ready to burnish. A superior burnish will result if they can remain twelve hours after lubricating as directed, spread in the cellar. I have since made another improvement, substituting for the cellar a tight tin box, which I had made large enough to hold my prints flat. Care must be taken not to have the prints too damp. I run them through, lightly, twice across the burnishing tool, until all are through, then run about four times again, commencing with the first; I run the first thin.

I find the following to serve admirably as a "lubricator:" A. Paraffin, 8 drams; benzine, 10 ounces. B. In a mortar grind gum ammoniacum 30 grains, in alcohol sufficient to prevent the gum from sticking to the pestle. Add A and B together, shake well, and apply with a flannel rag or sponge.

JOHN D. CLEMONDS.

MAY 22, 1917.

To Print on Linen or Silk

TO THE EDITOR:

SIR: *To Print on Linen.* Make a salting solution of two grains of chloride of ammonium to every ounce of water. Make a sizing solution of

Water	20 oz.
White glue	2 gr.

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Soak the glue in hot water until it is dissolved, and then apply the solution to the part to be printed upon. When dry, apply the silver solution with a tuft of cotton, shielding the unsized portions of the linen. Fume when dry, and print in the usual way, or in the handkerchief printing-frame. Tone in your usual toning solution, fix, and wash well, using *hot* water for the final washing.

Printing on Silk. Pour 20 ounces of boiling water on 100 grains of chloride of ammonium and 60 grains of Iceland moss. When nearly cold, filter, and immerse the silk in it for fifteen minutes. To *sensitize*, immerse the silk in a twenty-grain solution of nitrate of silver for sixteen minutes. Let the nitrate bath be rather acid. When dry, prepare for printing by attaching the silk to a piece of cardboard a little smaller than itself, by turning the edges over and fastening with small bits of gummed paper; slightly over-print. Wash in two or three changes of water, and tone in a gold bath, thus:

Water	20 oz.
Acetate of soda	2 dr.
Chloride of gold	4 gr.
Common whiting	a few grains

Filter, and keep for twenty-four hours before using. Let the prints be toned slightly bluer than required to be when finished. Rinse them in water, and fix in a solution of hypo, four ounces to the pint of water. Twenty minutes is ample time for fixing. Wash well.

GEORGE W. PHILIPS.

MAY 8, 1917.

A Simple Printing Mask

TO THE EDITOR:

SIR: To print neatly and expeditiously from small-sized film negatives the following will be found a convenient method: Use any printing frame larger than the size of negative, place a piece of plain glass in same, and paste a sheet of opaque paper on the outer side, in which an aperture has been cut a trifle smaller than the size of negative. On the inner side of the frame place a piece of stout cardboard with an opening cut in the centre the exact size of negative. This simple appliance will be found a great time saver, as film and paper are merely dropped into the opening in the cardboard, frame closed and exposed.

GEORGE ROGERS.



THE WORKROOM

By the Head Operator



A COLLECTION OF FACTS
DARK-ROOM POINTERS
CLEANING MEASURE GLASSES
USING A DEVELOPING TANK
GET YOUR PRINTS OFF
KEEPING THE BACKGROUND PLAIN
REPRODUCTION OF BLACK AND WHITE
DARK-ROOM SWITCHES
ENLARGED NEGATIVES QUICKLY
COMFORT IN THE DARK ROOM
WORKROOM RECIPES
REDUCING OVERDEVELOPED AND FOGGED NEGATIVES

AN IMPROVED PERSULPHATE REDUCER
AN EASILY MADE, INEXPENSIVE STUDIO SHUTTER
RED BROMIDES
CONCERNING SECOND-HAND APPARATUS
SIMPLE BACKGROUND PAINTING
RESCUE WORK AMONG "HOPELESS" NEGATIVES
TOOLS AND THEIR USERS
TO REMOVE WRINKLES FROM BACKGROUNDS
THE BEST TYPE OF NEGATIVE
DIRECT POSITIVES ON BROMIDE PAPER
PREPARING NEGATIVES FOR PRINTING

A Collection of Facts

HERE are formulated a collection of facts in the form of if's and don'ts, from which the following statements have been compiled to apply to all developers, in a general way.

Before you knock, investigate the cause of your complaint—look at our list of questions. If you are beyond those questions, the fault is certainly not with you.

The usual troubles are: impure or grayish whites, greenish or brownish tones, contrasty, or weak prints (lacking detail), flat or "muddy" prints, or too dark prints, yellowish or brownish stains, round dark spots, blisters, discoloration around edge of prints, curling or cracking of the surface, round white spots, surface marks (on glossy paper), etc.

The following questions will point out a remedy for the usual photographic troubles.

1. Are you a careful operator, or do you carry developer in your hands over to the fixing bath, and *vice versa*?
2. Is there anything wrong with the negative?
3. Are you exposing right, or are you over- or under-exposing?
4. Is your laboratory too warm, or damp, or exposed to chemical fumes, or sewer gas?
5. Is your balance accurate?
6. Are the weights accurate?
7. Any mistakes in the weighings?
8. Is your water pure and clean?
9. Are your chemicals pure?
10. Did you mix your chemicals in the proper order?
11. Was the solution clear before you added the next chemical?
12. Is your developer too old?
13. Are you "forcing" your developer?
14. How long are you developing?
15. Are you "spreading" your developer properly?
16. Is the amount of potassium bromide right?
17. How about the temperature?
18. Is the temperature of all the baths about the same (65° F. to 70° F.)?

19. What paper are you using?
 20. Is it suited for your purpose?
 21. Is it "too dry," or has it been spoiled by light, fumes, or otherwise?
 22. Are you printing too close to light?
 23. Did you allow prints to cool before developing?
 24. Did you move prints about, while in the different baths?
 25. Did you look out for air "bells" and "bubbles?"
 26. Did you crease or break any prints while washing?
 27. Did you let the water run from the tap directly on the print?
 28. Did you have sufficient hardener?
 29. Was fixing bath acid? Was it milky?
 30. Do you wash thoroughly?
- After this, blame your materials.—*Northern Photo News*.

Dark-room Pointers

1. The use of distilled water in the preparation of all photographic solutions will increase efficiency over 50 per cent.
2. "Old" developing solutions may be brought up in speed and intensity by adding a little fresh developer occasionally.
3. All prints should be exposed long enough so as to insure complete development in about one minute's time; but avoid over-exposing as far as possible.
4. When development is complete, immerse prints immediately in acid "check bath" (1 oz. acetic acid in 32 oz. of water). This will harden the prints and minimize any tendency to staining.
5. In a nutshell: develop; check; fix; wash thoroughly—there's a lot in that, if done right.
6. Glossy papers are prone to yield abrasion marks; these are easily prevented by using a few drops of a 20 per cent. solution of potassium iodide.—*Northern Photo News*.

Cleaning Measure Glasses

FOR cleaning graduates which have become stained in use, go to the pantry and get the vinegar bottle; pour some into the graduate and also add a small quantity of coal dust—say a tablespoonful. Well wash the graduate with the above solution, allowing the small coal to swirl round the inside with the vinegar. I have found this a quick and effective way of cleaning the graduate when the commercial hydrochloric acid usually recommended is not to hand.—*Amateur Photographer.*

Using a Developing Tank

ONE day I determined to use the time and temperature method of development, and obtained a metal daylight developing tank for the purpose. My first attempts were not successful, however, as the plates when finished were badly streaked with mysterious horizontal markings, stretching from side to side of the plates. I was somewhat at a loss to account for the trouble until it struck me that the developing solution was very slow in filling the tank, and it was not always possible to keep up a good steady flow of solution so that it evenly covered the surface of the plates. We are told in text-books on development that it is a bad plan to soak our plates in water before development, as it is a productive source of air-bells. Anyhow, I thought I would try filling up the tank with plain water for a few moments. This I did, and then filled up with developer and developed as usual. I obtained six excellent negatives as the result, quite free from markings of any kind and with no trace of air-bells or fog. I have in consequence adopted this method for all my plates, and have obtained some dozens of quite good and satisfactory technical negatives. My theory is that when the plates are first soaked in water the film becomes somewhat like a sponge in character or a sheet of blotting-paper, and the developer, instead of having to rely upon the gradual upward rush of the increasing volume of liquid for its distribution over the film, soaks its way over the gelatin and thus prevents the formation of a hard and straight line, which is probably the cause of those marks on the negative.—*Amateur Photographer.*

Get Your Prints Off

GOOD work won't always make a good business. It is important to give your customers what they want—but it is just as important to give it to them how they want it and when they want it.

It may very well be laid down as an axiom for the professional photographer that when proofs are delivered quickly the chances of getting a big order are increased, and that when the order is delivered promptly the chances of getting a re-order are also increased.

When photographers used nothing but daylight printing processes, the weather was often blamed for delays in getting out orders. But customers will not listen to the weather excuse now. They know that most of the work is printed by artificial light; and that, when there

is a delay in the delivery of their orders, the fault lies with the photographer and not with the weather.

A professional, whose aim is to make progress, cannot hold on to the old methods of printing; he *cannot* afford to get behind with his orders; and he *cannot* afford to lose customers. The man who takes advantage of modern inventions for rapid artificial-light printing gets his work out quickly, pleases his customers and increases his business. More than that, he is in a position to take on special work which the man without these facilities would not be able to touch.

Take, for example, two photographers in a small town. One uses a modern printing machine, and the other uses an old-fashioned printing frame. Some event of local interest takes place in the town. Both photographers make negatives. The man with the printing machine gets at least two hundred prints out within a few hours, and makes his sales; the other man is not able to get out more than a few dozen copies, which remain unsold.

The photographer who wants to get his work finished and delivered in good time, must fit up his workroom with one of the modern printing machines.—*Photo Digest.*

Keeping the Background Plain

WHATEVER we select for the background, we must remember to arrange it in one of two ways. Either it must appear in the picture as a perfectly smooth tone, without any suggestions of detail or form, or else it must suggest or indicate its nature and form, in which case it must be the subject of careful attention. So many of the photographs which are made fail in this respect. It is evident from them that the photographer has hung up a sheet or some similar thing to serve as a plain background but that he has taken no further pains to get it plain. The consequence is that creases, or folds, or texture, or dirt marks, or one of the many things that ought not to show where all is to be plain, do show, and by the otherwise plain character of the background they are specially conspicuous.

Therefore, we lay stress on the need to stretch the paper on a card or board. It should be paper without any very pronounced grain. It should be sufficiently far behind the actual subject of the picture to be out of focus; although this should not be detected, as it should have no detail or other irregularity of surface to show whether it was in focus or not. It is sometimes possible to hide any irregularities by moving about the background during the exposure; but there is always a risk in so doing of moving the subject also.

The tone of the background need not be alike all over. It may be graduated so as to be lighter on one side than the other; and a very beautiful and even graduation may be obtained very simply by using a large enough background and bending it into a curve, so that one part catches the light more than another.

A somewhat similar set of considerations applies to the surface on which the subject is to be placed. Sometimes a long strip of card or paper can be used to support the subject

and to come up behind it also and serve as the background; but it is generally more satisfactory to indicate both a horizontal and a vertical surface. In that case we get a horizontal line across the picture, where the background meets the "floor;" and it is well to have this far enough behind the object to be fuzzy. At the same time it should be straight, and there should not be any signs of an imperfect junction, such as we see when the roller of a rollable background is allowed to lie on the floor—a fault frequently noticeable in amateur portraiture.

On a small scale, we can deal very well with such a case by arranging the object on a sheet of card on the table, with a fair extent of card behind the object, ending in a straight, clean edge. The background is supported separately a few inches behind this edge, and carried below it, so that the bottom of the background is not seen from the lens at all. It is difficult to explain why, but this method seems to give more relief or solidity to the object than most other methods; whatever it is we are photographing does not appear to have a background pushed close up against it.—*Photography*.

Reproduction of Black-and-white

In the reproduction of subjects in black-and-white—that is, manuscripts, engravings, line drawings, plans, etc.—a method must be employed entirely different from that made use of in reproducing subjects having half-tones or gradations of light and shade.

We must have an entirely different mode of illumination, and must endeavor to get rid of the grain of the paper, or rather the shadow of the grain. A flat light is indispensable, and this is best secured out of doors, the illumination coming from the front.

First let us consider the kind of plate. For some kinds of work the so-called process plate or photomechanical plate may be made use of; but if the original is an old manuscript such a plate is not as good as a quick bromide plate, but the best kind of plate for old documents is an orthochromatic plate.

Mr. F. E. Ives recommends the following method for orthochromatizing an ordinary plate. Dissolve one grain erythrosin in four ounces alcohol. Filter the solution. Bathe the plates in this for two minutes, rocking the tray, then wash in distilled water and dry.

As regards exposure, it is best to make a trial plate for varying periods. Give the whole plate thirty seconds, then push in the slider a certain distance, giving forty-five seconds, or fifteen seconds more, and so until you give ninety seconds. One cannot get the best results without ample exposure, but excessive exposure is to be avoided, as it clogs up the lines and defeats efforts after density. The lines in the negative should be clear glass and the page dense black.

The Development. Pyro is capable of giving density, but it has a tendency to veiling or of showing the characteristic pyro stain. Hydroquinone is preferable to any other agent.

Lumière's formula is perhaps the best:

Hydroquinone	8 gr.
Sodium sulphite (gran.)	80 gr.
Formaldehyde	1 dram
Distilled water	1 oz.

This contains neither alkali or bromide, but yields very intense negatives. In cold weather this developer must be warmed to 70 degrees.

The main thing to be observed for black-and-white work is clear lines, so if it should happen that your developer gives any indication of veiling stop developing at once, wash off and fix thoroughly, and again wash well from hypo.

If on examination any sign of veiling is visible in the negative, it will be absolutely necessary to clear up the plate before intensification.

Belitzski's formula is good:

Potassium ferric oxalate	10 gm.
Sodium sulphite (gran.)	8 gm.
Oxalic acid	3 gm.
Hypo solution ($\frac{1}{2}$)	50 c.c.
Water	200 c.c.

Flow the plate over with this until the lines are clear glass and then wash.

Another clearer (Bartlett's) is:

Perchloride of iron (ferric chloride)	60 gr.
Citric acid	120 gr.
Water	16 oz.

Bathe the negative in this and then thoroughly wash.

A good intensifier is iodide of mercury, made by adding a solution of potassium iodide to a solution of mercuric chloride (10 per cent. solution) until the brilliant precipitate formed just redissolves. After intensification, soak for ten minutes in sodium sulphite and wash.

Pencil drawings sometimes gives much trouble in copying. A piece of very fine ground glass placed in close contact over the pencil drawing in a printing frame, and the copy made through this, gives better results than direct copying.

Blue prints are, of course, hard to reproduce. A yellow screen placed in front of the print turns the lines into a dirty green. An orthochromatic plate is then made use of.

The paper employed will depend upon the character of the print required. Platinum, of course, may be made to give rich black lines, but bromide paper, properly treated, gives as good results at much less cost.

Ferrous oxalate must be used, about one part of iron solution to five parts of oxalate solution. Add the iron to the oxalate and about five drops of 10 per cent. solution of bromide of potassium and five drops 10 per cent. solution of citric acid to every six ounces of developer.

Dark-room Switches

In any dark-room the provision of a full flood of white light is a means of preserving cleanliness and order, which should on no account be neglected. All the better, on the score of ventilation, if the white light is that from an open window, but if it is electric, then care

requires to be taken that the white light cannot be switched on by mistake or through the fault of an assistant unfamiliar with the dark-room arrangements. We have been in dark-rooms where the most elaborate system of wiring has been adopted in order to obtain automatic security in this respect, and in some instances have noted that such complicated connections were apt to break down in practice. One of the simplest means by which to avoid the mischance of switching on white light is to place the switch fairly high up on the wall so that the hand has to be raised well above the level of the head in order to operate it. The drawback to this is that it is beyond the reach of assistants of small stature and, therefore, perhaps a more generally serviceable plan is to provide the white switch with a thin wooden casing or fence into which, either from above or below, the hand requires to be thrust in order to complete the electrical circuit. With a guard of this kind any switching on of white light cannot be said to be due to mere carelessness, but is an act of pure mischief, for which an assistant could not expect to escape reprimand.—*British Journal of Photography*.

Enlarged Negatives Quickly

ONE of the methods for the making of enlarged negatives, which apparently is not so generally used as it deserves to be, is particularly suitable for the purposes of a professional photographer, who has usually at his disposal the large camera which is required. It consists in making from the small negative a print on glossy or semi-glossy print-out paper of depth which looks just right, that is, is not over-printed as for toning. The copying camera having been set up and adjusted according to the degree of enlargement required in the enlarged negative, this print is then copied, enlarged, upon a plate of medium speed. This can be done by either weak daylight or artificial light, without the print suffering in any way during exposure, although it should not be exposed longer than can be helped and, therefore, focusing should be done in advance upon a piece of printed matter, the place of which is taken by the P. O. P. print when all is in readiness for exposure. We recently saw in an acquaintance's studio a very neat accessory for facilitating the use of this method in conjunction with the ordinary studio camera. It consisted of a long, narrow, and light baseboard, at the end of which was fixed, at right angles, a small easel for the support of the print. The studio camera had been slightly adapted, so that this baseboard could be slid under a pair of guides secured to the camera baseboard, and the small easel thus be placed at any required distance from the lens. Undoubtedly, for all copying work a camera set apart for the purpose is the better plan, but in this case the appliance could be made ready for operation in a minute or so.—*British Journal of Photography*.

Comfort in the Dark-room

THE average dark-room is often an uncomfortable place, but in seeking to remedy this state of things it is useless to proceed on wrong

lines. Ventilation, or the want of it, is, of course, one of the chief defects, but unfortunately so little is generally known of the first principles of good ventilation that the remedies attempted are often ineffective. There is in general a vague idea that the discomforts of bad ventilation are due to the exhaustion of the oxygen and the increase of carbonic acid in the atmosphere. In an hermetically sealed room both things will doubtless happen in course of time, but no ordinary room, not even the average dark-room, is hermetically sealed, and the result is that a certain balance between the two gases is always preserved, the carbonic acid never increasing beyond a certain very small amount, and the oxygen never diminishing below a quantity that is amply sufficient for breathing purposes. The experiments of Dr. Leonard Hill have shown that even in the worst cases of want of ventilation the discomfort felt is due to want of movement in the air and to unsuitable temperature, the immediate cause of the discomfort being the stoppage of evaporation from the body. It can easily be understood that if a man is in absolutely still air at nearly body temperature all evaporation will cease, and so he will develop symptoms of self-poisoning. To explain in other words, the effects of want of proper ventilation are simply an exaggerated version of those produced in all people in still, hot, damp, muggy weather. We may be out in the open air and yet experience just the same sensations as those felt in a close unventilated room. The lassitude which all attribute to the weather is only a first stage of the exhaustion felt in the room, and in neither case can the bugbear of carbonic acid be justly credited with the discomfort. This unfortunate gas has even been credited with the property of causing prints to fade and with various other crimes beyond that of suffocating dark-room operators, but such theories may safely be disregarded. We have also quite recently seen an article in which the well-known headache effects produced by the red lamp on some persons have been attributed to carbonic acid and bad ventilation. There is, however, no room to doubt that the light itself is prolific cause of dark-room headache.

The chief ills of the dark-room may be enumerated as follows: (1) stagnation of the air or want of movement; (2) excessive warmth; (3) excessive moisture; (4) foulness of air due to lack of proper ventilation in the form of exhaust; (5) eye strain due to too feeble or bad lighting, or to red light. Taking these in order, the most efficient remedy for the first defect is a fan inside the room, arranged to keep the air circulating, independently of any similar apparatus that may be used for pumping air either into or out of the room. A less effective, but still a working substitute, is an open coal or gas fire in cold weather, while a running tap or a gas burner will even help somewhat. The second trouble of excessive warmth is somewhat difficult to deal with. Cold air pumped or drawn into the room is, of course, effective, but in our experience a continual stream of cold water running through a large dish is by no means to be despised as a cooling agent. Excessive dampness will only lead to discomfort when combined with intense

warmth, and while a dark-room is always damp, as evidenced by the readiness with which metals rust, this will not lead to oppression until the air becomes warm and also saturated with extra moisture given off by exhalations. Foulness of the air is best dealt with by a good exhaust system. Pumping fresh air into the room will not get rid of the foul smell so rapidly, while it tends to add to discomfort by increasing the atmospheric pressure. Exhaustion relieves the pressure and also rapidly sucks out all foul-smelling emanations. Gas burners are also a good remedy for foulness, as they create a big draught and purify the air by burning up offensive matter. The last cause of trouble, the light, is one that is much neglected. Eye strain is the commonest cause of headache, and this may be induced by endeavoring to see either by a feeble, inefficient light or by a red light, in which many people are quite unable to see acutely without very great effort. The main reason is simply that the eyes cannot accurately focus themselves upon red, and the continued effort to do so soon gives rise to headache. As a matter of fact, red safelights might well be dispensed with altogether. Neither yellow nor green light seems to have any injurious effect on the eyes, and with the yellow and the green safelights now upon the market all the requirements of safety as regards plates can be complied with.

While on the subject of light it is also worth while considering the white light employed, for in some cases when no development is going on the dark-room is used for other purposes for long periods of time. There is no doubt whatever that many people find electric light very trying to the eyes, but whether this is due to the nature of the light or to the form of the lamp is a little uncertain. The trouble due to the electric lamp has often been obviated by resorting to the old type of upright incandescent gas-burner, the illumination from which is mostly reflected from the ceiling. The more modern inverted burner, however, imitates the electric lamp in form, and there is some reason to believe that this form of gas lighting gives nearly as much worry to some people as the electric lamp. There is no doubt whatever that the best way to light a room is by light reflected from the ceiling, and no room of any kind can be considered to be properly or safely lighted if the ceiling is in shade. Half the trouble with electric light is probably due to the fact that the lamps are nearly always in full view and not properly arranged so as to be invisible, while the other half may be due to the composition of the light, which is not nearly so white as that given by gas.

To sum up the conditions conducive to comfort we may put, first, the provision of a fan to keep the air circulating. This need not always be going, and a clockwork fan can be run at no expense. Second, an efficient exhaust is wanted, with adequate fresh-air inlets. Owing to the necessity of keeping out light we cannot well rely on so-called "natural" ventilation, which is dependent mainly on the provision of large and ample openings for the admission and exit of air. We must have some artificial system, and an exhaust fan is certainly the best, while we

strongly deprecate any attempt to force air into the room. The inlets should, of course, be fitted with dust-filtering screens which should be renewed frequently. An efficient exhaust near the ceiling will also keep down the temperature of the room, while it will also keep the room free from chemical fumes. As regards lighting, we would much like to see the abolition of red safelights altogether, and the substitution of green lights in their place. This we would recommend, and also the abolition of all open unscreened white lights. The general illumination of the room should be solely by light reflected from the ceiling. Open lamps may be required for printing purposes, but these should also be so far enclosed that the worker may not see the lamp itself while he is making the exposure.

One other item conducive to both physical comfort and health is the abolition of cold or damp floors. The floor should be waterproof, so that any spilt fluid may be readily mopped up or swept away. Neither stone nor cement, nor any similar cold material is at all advisable, even if covered with wood grids, for these latter prevent the mopping up of liquids, while they are painful to the feet after long standing. There are some patent compositions that make very good floors, but in general we think there is nothing will beat, as regards efficiency and cheapness, a wood floor covered with good lino, well cemented down with waterproof joints, and waxed over now and then on cleaning days. One more matter often neglected is the height of sinks and benches. These should never be so low as to necessitate stooping over the work. For standing work 3 feet to 3 feet 3 inches is the proper height for a bench, and a developing sink may be 3 feet 6 inches with advantage. The ordinary table height of 2 feet 6 inches is too low for any work that is not done sitting, while if seats are required high stools can be used with the higher benches. Too low a bench means backaches as well as headaches, and it is detrimental both to health and efficiency.—*British Journal of Photography.*

Workroom Recipes

1. *Blackening Brasswork.* Prepare two solutions. Copper nitrate, 200 gr.; water, 1 oz. Silver nitrate, 200 gr.; water, 1 oz. Mix, clean the articles thoroughly, and then place in solution. Remove and heat strongly.

2. *Dead Black Varnish.* Benzol, 1000 parts; India-rubber in shreds, 6 parts; asphaltum, 300 parts; lampblack as required.

3. *Dead Black for Woodwork.* Shellac, 40 parts; borax, 20 parts; glycerin, 20 parts; water, 500 parts. After dissolving add 50 parts anilin black.

4. *Dead Black for Wood.* (a) Borax, 30 gr.; glycerin, 30 minims; shellac, 60 gr.; water, 1 oz. Boil till all dissolves and add nigrosin W. S., 30 gr. (b) Copper chloride, 75 gr.; potass. bichromate, 75 gr.; water, 2½ oz. Paint with this, let dry, and apply: Anilin hydrochloride, 150 gr.; water, 2½ oz. Wipe off any yellow powder that forms, repeat process till black enough, and finally rub over with boiled linseed oil.

5. *Black for Aluminum.* Clean with fine emery, wash well, and dip rapidly in: Ferrous sulphate, 1 oz.; white arsenic, 1 oz.; hydrochloric acid, 12 oz.; water, 12 oz. When the color is deep enough dry off with fine sawdust and lacquer. The metal should be very rapidly dipped and as quickly withdrawn from the mixture and allowed to drain, repeating the operation, if necessary.

6. *Liquid Glue.* Swell glue (8 oz.) in water (10 oz.). Dissolve on water-bath and add slowly, with constant stirring, nitric acid, sp. gr. 1.33 (2½ oz.). Keep well corked.

7. *Damp-proof Glue.* Dissolve common glue in the smallest possible quantity of water, and, while hot, add one-quarter its bulk of linseed oil, stirring rapidly during the addition.

8. *Cement for Vulcanite.* Sulphur, 1 part; caoutchouc, 3 parts; alcohol, 6 parts; bisulphide of carbon, 100 parts. Mix alcohol and bisulphide, and then dissolve caoutchouc and sulphur therein. Evaporate to consistency of thin paste. Join the fractured edges with this and heat the whole to about 300° F. for four hours.

9. *Marine Glue.* India-rubber shreds dissolved to saturation in crude benzene, 1 part; shellac, 2 parts. Mix by aid of heat.—*Jeffrey.*

10. *Cement for Porcelain Dishes.* Water-glass, 6 parts; fish glue, 4 parts; precipitated chalk, 1 part. Rub down to a paste, brush over broken surface, press into contact, and dry in warm place.

11. *Sulphur Cement for Porcelain.* Sulphur, 7 parts; white pitch, 5 parts; bleached lac, 1 part; mastic, 2 parts; elemi, 2 parts; finely-powdered glass (this must be as finely ground as flour), 7 parts. Melt the first five ingredients together by heat, and finally stir in the glass powder, which should be shaken in through a fine sieve.

12. *Cementing Glass to Glass or to Metal.* Heat guttapercha and shellac (equal parts) in a jar placed in a saucepan full of sand, which, when placed on the fire, enables the mixture to be melted; or mix glycerin and litharge in very fine powder to dough-like consistency. In mending dishes moisten first with glycerin, then apply the cement and bind together for a day or two. Or dissolve thin shreds of gelatin to saturation in acetic acid and fill into small bottles. Stand the bottle in hot water before use. This is known in the jewelers' trade as "Diamond" or "Armenian" cement.

13. *Cement for Leather.* Guttapercha in carbon disulphide, made syrupy. Use hot.

14. *Guttapercha and Paraffin Wax Varnish.* Very suitable for waterproofing dishes. Take equal parts of wax and gutta, melt the gutta in a saucepan, add the wax, and mix thoroughly. Apply hot.

15. *Water-tight Varnish.* Brown resin, 8 oz.; beeswax, 2 oz. Melt together in a tin pan, and, when quite fluid, coat the dish, which should be quite dry and warm.

16. *Waterproofing Wooden Dishes.* (a) Inside and out, two coats each of Brunswick black.

(b) Asphalt (1 part) in benzol (20 parts). Two coats.

(c) Melted mixture of resin and beeswax (equal parts). Iron into the wood with a hot

flat-iron. Melted paraffin, used in the same way, also answers well.

(d) Shellac varnish.

17. *Waterproofing Wood.* Asphalt, 4 oz.; pure rubber, 30 gr.; mineral naphtha, 10 oz. Apply three coats with a stiff brush, drying after each.

18. *Varnish for Wood.* Useful for inside of wet-plate slides, etc. Sandarac, 4 oz.; Columbian spirit, 12 oz. Dissolve and add 200 gr. Venice turpentine.

19. *Varnish for Brass.* Celluloid, 7 gr.; amyl alcohol, ½ oz.; acetone, ½ oz. Used cold.

20. *Black Varnish.* Benzol, 10 oz.; turpentine, 1 oz.; masticated rubber heated to fusing, 100 gr. Dissolve the rubber in the benzol and turpentine; add 4 oz. of asphaltum, broken small.

21. *Elastic Caoutchouc Varnish.* Heat 2 parts of common resin in a saucepan until it gives off a vapor; add 1 part of caoutchouc, and stir until thoroughly mixed; then remove pan from stove and add 2 parts linseed oil; heat well and stir until quite cold.

22. *To Clean Bottles*—from photographic solutions: Spirits of salts mixed with equal bulk of water.

—from grease: Commercial benzol followed by strong soda solution.

—from varnish: Columbian spirit (10 parts) and ammonia (1 part); then ammonia and water (1 in 10), and, lastly, water.

23. *Ink for Glass Bottles.* Dissolve powdered copal (60 gr.) in warm oil of lavender (1 oz.) and mix on a stone (with a palette knife) with lampblack (6 gr.) and indigo (2 gr.).

24. *Lute for Ether, Spirit, etc.* Melt good glue (3 parts) in hot water (9 parts) and stir in glycerin (2 parts). Color with anilin dye and dip necks of bottles (free from grease) in mixture.

25. *White Ink.* Gum arabic, 1 oz.; water, 4 oz. Strain through muslin and add enough zinc white to make the ink smooth. Rub up on a glass plate with palette knife or glass muller. If too thick dilute with water. To preserve add a few drops of carbolic acid.

26. *Fine Matt on Glass.* Dissolve gelatin (20 gr.) and sodium fluoride (20 gr.) in warm water (1 oz.). Pour over glass, allow to set while level, and leave to dry; then immerse in hydrochloric acid (½ oz.) and water (8 oz.) for thirty seconds and set up to dry. Fine matt on cleaning off the gelatin.

27. *Silvering Mirrors—Drayton's Process.*—A mixture is made of 1 oz. of coarsely powdered nitrate of silver, ½ oz. of spirits of hartshorn,¹ and 2 oz. of water, which, after standing for twenty-four hours, is filtered, and an addition is made thereto of 3 oz. of wood alcohol at 60° above proof, or naphtha. From 20 to 30 drops of oil of cassia are then added, and, after remaining for about six hours longer, the solution is ready for use. The glass to be silvered with this solution must have a clean and polished surface. It is to be placed in a horizontal position and a wall of putty or other suitable material formed around it, so that the solution may cover the surface of the glass to

¹Spirits of hartshorn is a mixture of liq. ammoniac forte 1 part, water 2 parts.

the depth of from $\frac{1}{4}$ to $\frac{1}{2}$ of an inch. After the solution had been poured on the glass, from 6 to 12 drops of a mixture of 1 part, by measure, of oil of cloves with 3 of Columbian spirits are dropped into it at different places, or the diluted oil of cloves may be mixed with the solution before it is poured upon the glass. The more oil of cloves used the more rapid will be the deposition of the silver, but the operation should occupy about two hours. About 18 grains of nitrate of silver are used for each square foot of glass.

28. *Furniture Cream.* Linseed oil, 80 parts; spirits of camphor, 8 parts; vinegar, 16 parts; butter of antimony, 4 parts; liquid ammonia, 1 part, and water, 1 part. This must be applied sparingly by means of a piece of old flannel, and well rubbed off with very soft rags.

29. *To Renovate Morocco Leather.* White of five eggs; sperm oil, 6 oz.; acetic acid, 6 dr.; glycerine, 6 dr.; oil of turpentine, 1 oz.; Columbian spirit, 5 oz.; water to 30 oz. Beat the eggs thoroughly with an egg-beater. Mix the oils, acid, and glycerin, and add gradually to the eggs, using the beater constantly. Transfer to a bottle and add the spirit diluted with its own volume of water; finally, make up to measure. Anilin dyes may be added according to color required. About 200 grains will be sufficient for the foregoing quantity of reviver.

30. *Varnish for Restoring German Gilt Moldings.* Gamboge, 30 gr.; dragon's blood, 240 gr.; powder and add: Tumeric, 30 gr.; shellac, 2½ oz.; sandarac, 2½ oz. Place the whole in a bottle and add 2 oz. dry oil of turpentine. Shake often and keep in a warm place for fourteen days. Filter and add 4 oz. of clear mastic varnish.

31. *Rubber Stamp Ink.* Anilin red (violet), 90 gr.; boiling distilled water, 1 oz.; glycerin, 30 gr.; treacle, 15 gr.

32. *To Recover Fogged Plates.* Immerse for five minutes in chromic acid, 30 gr.; potass. bromide, 60 gr.; water, 10 oz. Wash dry; reduces speed considerably. They can be made suitable for use as transparencies by soaking them in the following solution: Potassium bromide, 1 oz.; potassium iodide, 60 gr.; warm water, 2 oz. When dissolved add hydrochloric acid, 2 oz.; potassium bichromate, 1 oz.; water to 80 oz. The plates should be well washed after immersion (in the dark room, of course) and dried. They will require eight times the normal exposure, and should be developed with hydroquinone.

33. *To Dull Bright Surfaces of Machinery, etc.* Make thin cream of white lead and turpentine, add lampblack to make a gray tint, and then one-sixth the bulk of gold size. Paint over and remove afterward with "cotton waste" damped with benzene or turpentine.

Reducing Overdeveloped and Fogged Negatives

OFTENTIMES a negative possesses excellent qualities, but is too dense or too opaque for printing purposes, through over-exposure or over-development, or both; in either case the negative is termed a hard printer, owing to those

parts which should have been almost clear glass being so clogged by a deposit of silver, thus preventing the penetration of light. Again, there are negatives that are so hopelessly fogged by being light-struck, where a ray of light has been allowed access to the plate previous to exposure, so that a partial reduction has taken place upon the sensitive surface, which, upon development, has caused a complete fogging of the negative. In a case of this sort it must be discarded as useless; but where the negative is only veiled through faulty development, it can be made into one of good quality by care being exercised in the process of reduction. The method is simple, easy to work and sure in its action.

There are several ways of reducing a negative that is too dense; one plan is to let the negative remain in a strong solution of common alum for twelve hours; another is to let it remain in the acid alum hypo fixing bath for the same time. A glycin developed negative will quickly reduce in such a bath, persulphate of ammonia cannot be depended upon. Only a year ago I completely spoiled four valuable negatives 6½ x 8½, all interiors, by the use of this much vaunted chemical; that was enough for me; once the persulphate solution had penetrated the film its reducing action would not stop; it continued even in a forced stream of water until the negatives were ruined.

This led me to try a modified way of the employment of the reducer of Howard Farmer, which I have ever since employed whenever reduction is necessary. In this case I hold to the proportions named; they have worked so satisfactorily that is reason enough for adhering to them.

In separate bottles make up the following:

Hyposulphite of soda	3 oz.
Water	18 oz.

In a second bottle of yellow or brown color I mix

Ferricyanide of potash (red prussiate)	2 oz.
Water	20 oz.

When dissolved, soak the negative to be reduced in the hypo solution. While that is soaking I mix equal parts of the ferricyanide solution and water. Then, take the negative (without washing) and place it directly into the second bath; simply tilt the tray a few times, remove the negative, wash it and examine. Generally, if slight reduction is all that is needed, this treatment is sufficient; if it is not, a second dip in the hypo, or perhaps a third, and a wash in the red prussiate liquid will accomplish what is necessary. Then, after an hour's washing in the negative washing box, the plate is dried, and any after touching-up is done with a brush and pencil.

I have found in practice that by using the solutions weak, with separate dippings, that the exact reduction can be obtained in a better way than by mixing the strong solutions.

4 An Improved Persulphate Reducer

AMMONIUM persulphate is undoubtedly one of the most useful and popular reducers for negative work, in spite of the fact that in dealing with a variety of negatives its behavior is somewhat erratic.

Those who are not familiar with this reducer may like to note that its action takes place in two stages. The first stage, during which no perceptible change occurs, may last from a few minutes to an indefinite period. During all this time the negative must be watched, as the second or active stage may be entered upon at any moment, and when once it has started action proceeds with great rapidity. In fact, so rapid is the action that one is usually advised to take the negative out of the solution a little before the required degree of reduction is attained, in order to allow for the continuing action. Further, it is essential to employ a stop bath, in which the negative must be kept in motion until the action of the reducer has definitely ceased.

The chemistry of the process is not fully understood. If we assume that the particles of silver to be reduced are at first covered with a substance only soluble with difficulty in the persulphate solution, which substance protects them from further action at the moment, we can account for the period of inaction; and the fact that a solution of persulphate of a strength of five grains to the ounce will in some cases act more efficiently than one containing twenty grains to the ounce, makes it appear as though the extra water in the dilute solution helped by favoring the solution of this compound.

With this hypothesis in view, the writer has recently experimented on the effect of adding certain solvents of silver salts, notably hypo, in varying proportions to the persulphate solution. Chemists tell us that hypo destroys persulphate, reducing it to the inert sulphate; and, according to the equation, a given weight of hypo is able to destroy about its own weight of persulphate. But this reaction evidently does not take place when the two substances are merely mixed in solution; for the writer has used as a powerful reducer with perfect success a mixture containing ten grains of persulphate with four times its weight of hypo, which quantity sufficed to reduce a fairly dense half-plate, and was not then exhausted.

As it is possible, therefore, to use these two substances in combination, it is interesting to see if there is any advantage in so doing.

After many experiments with old negatives, which were cut in portions, and treated as regards one portion with persulphate alone, and as regards another portion with a mixture of persulphate and hypo, it was decided that a good mixture to employ consisted of fifteen grains of persulphate and fifteen grains of hypo to the ounce of water. This mixture took rather longer altogether to effect the same reduction than a solution containing ten grains to the ounce of persulphate without any hypo; but it by no means follows that a weaker mixture of hypo and ammonium persulphate would not answer the purpose equally well. However,

the experiments were continued with the strength above mentioned.

The difference in the behavior of the solution containing hypo, as compared with plain persulphate, was most marked. With hypo present there is apparently no period of inaction and no sudden activity. The solution remains clear all the time; the process is completely under control; and the reduction may be stopped at exactly the right moment without having to make any allowance for continuing action, as no stop bath is required.

It remains to be seen what difference, if any, is caused by the presence of hypo on the final gradation of the negative. In order to test this, a plate was given a series of exposures, developed and fixed in the usual way, and then cut in strips, each strip identical with another as regards its range of tones. With such a set of strips as these it is easy to demonstrate the general behavior of any given reducer.

For example, with ferricyanide or with acidified permanganate, it is easy to see that the lighter tones are destroyed before much difference is made in the printing quality of the deepest. On the other hand, persulphate reduces the deep tones without at the same time eating out the lighter. Actually the presence of hypo in the persulphate might be expected to make the action approach more to that of permanganate or ferricyanide. Fortunately, however, that is not the case; for the appearance of the strips reduced with hypo and persulphate is practically identical, as regards the scale of tones, with those reduced with persulphate alone.

In making these tests as regards gradation, bromide paper was also employed as a matter of convenience, with the curious result that in all cases the time of reduction was found to be much less in the hypo mixture than in the plain persulphate. This was contrary to the experience with plates. Another point noticed was that a solution of five grains of persulphate to the ounce acted, with bromide prints, much more efficiently than one containing twenty grains to the ounce. The prints had not been treated with alum, or hardened in any way, and were freshly made. Amidol-developed prints reduced very slowly. On the other hand, a print developed with eikonogen reduced rapidly. This, however, was on another make of paper. The color of bromide prints reduced with persulphate and hypo is not altered, which is not the case when persulphate alone is employed.

The negatives used in the preliminary trials were some two or three years old, others were more recent, and developed with pyro-soda and amidol, and some with azol. The older negatives were not given a prolonged soaking before reduction, as is usually recommended; some were used after just a momentary dip in water, though others had a few hours' soaking. Needless to say, the persulphate was dissolved as required; while the hypo solution, to which the persulphate was added, was prepared by diluting the usual stock hypo solution of eight ounces to the pint.

Taking fifteen grains of hypo to the ounce of solution as the least quantity necessary to give

the required control, it will be found useful to increase this when dealing with exceptionally dense negatives. The hypo may be increased up to four times the amount of persulphate, the effect being to shorten the total time of reduction.

For example, a negative was cut in two, and placed dry, as to one portion, in persulphate fifteen grains, hypo sixty grains, to the ounce of water. The time required was eighteen minutes. The other portion was placed in persulphate fifteen grains, hypo fifteen grains, to one ounce of water. The time required was forty minutes. A similar negative was cut, and after soaking in water for an hour was placed, as to one portion, in persulphate twenty grains, hypo eighty grains, to one ounce of water. The time required was five minutes. The other portion of this was placed in persulphate twenty grains, hypo twenty grains, to the ounce of water, and took ten minutes.

It will thus be seen that by increasing the hypo independently of the persulphate, the time of reduction is halved. Also by increasing the persulphate together with the hypo the time is greatly reduced, if the negative is also soaked. The amount of solution used for a quarter-plate was one ounce, but this was so far from being exhausted that it could be used a second time, though naturally such a course is not to be advised as a general rule. Further, the times mentioned are only to be understood as applying to a given kind of negative and of a given density. Other negatives might reduce in less time, and others take longer.

A point which must not be overlooked in working with the mixture is that the reduction goes on without the appearance of milkiness in the solution about the surface of the plate, which is so characteristic of persulphate alone. Unless this is remembered, a worker accustomed to persulphate may think no action is taking place unless he examines the plate by transmitted light. A glass-bottomed dish, or, failing that, a light porcelain dish, facilitates the operation of judging density.—T. H. GREENALL, in *Photography*.

An Easily Made, Inexpensive Studio Shutter

THE advantages of using some form of shutter for portraiture so that the exposure may be made without the knowledge of the sitter are so obvious that it is probably quite unnecessary to recapitulate them here. It may, however, be profitable to consider what properties are essential in a shutter to enable the best results to be attained under all ordinary circumstances. First, it should be possible to give such a short exposure that it is unnecessary to warn the sitter to keep still. Then it should be noiseless in action; I consider any form of shutter that "clicks" as it opens quite useless; even worse than a cap, when taking dogs, cats, or nervous children. Animals will jerk the head to see where the click comes from, and the result is—spoiled plates and bad temper.

The writer, some months ago, being in a position of having to fit up a temporary studio, which might, and might not, pay, gave considerable thought to this matter of studio shutters. The

work done at the improvised studio would have to be good, yet (dare it be admitted) money was very scarce, and there was a decided reluctance to get into debt for what might prove, in the language of our theatrical brethren, a "frost."

Eventually the difficulty was overcome by making a couple of shutters at home, and as the total cost was only a few coppers, and the work involved was such that anyone might undertake who has the slightest idea of handling a few tools, it is hoped that a description may be welcomed by brother professionals who, for any reason, do not feel justified in spending the amount necessary for the purchase of one of the excellent shutters now on the market.

Let it be said at once that the shutters are of the "flap" variety, and the cabinet work (if such it may be called) of the very roughest description, the aim throughout being efficiency rather than elegance.

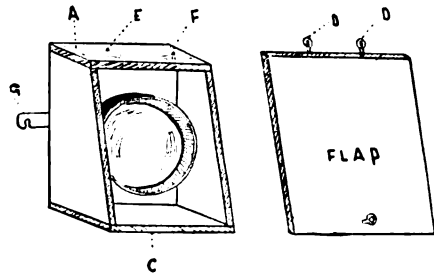


FIG. 1.—Shutter-box and flap. *G* is one of two hooks attaching shutter-box to camera front. *D D*, screw-eyes which are slipped over bent nails *E* and *F*, and attach flap loosely to box.

First, then, as to the dimensions. It is obvious that these will vary according to the size of the lens-tube to be used, for the shutter is designed to work inside the camera, being actuated by the simple method of pulling a string. This string release has two advantages. It is not affected by temperature, and so does not perish like rubber, and when, after a few thousand exposures it breaks, it can be renewed for a fraction of a penny.

Now to work. The shutter is composed of two parts, the box and the flap. The box is simply four pieces of wood nailed together at the corners, and is made from part of a chocolate box. The thickness of wood used is quite immaterial so long as it is strong enough to hold the small nails without splitting. ("One inch oval" are the nails used in the shutters I am describing.) The top portion of the box (*A*, Fig. 1) should be at least as deep as the lens will project into the camera. So that in the event of a portrait lens being used that racks in 2 inches, *A* should be 2 inches deep, by as many inches long as the lens is across, plus the thickness of the sides and about an eighth over to allow for clearance.

For instance, suppose the lens-tube is $2\frac{1}{2}$ inches in diameter, the box should be $2\frac{1}{2}$ inches square inside. It will be noticed that the

lower part of the box (*C*, Fig. 1) is deeper than the top; this is necessary, or the shutter will tend to remain open, because the flap would rarely return to the exact perpendicular.

Having made the box by sawing out the four pieces of wood necessary, and nailing the top and bottom to the sides, it should be neatly covered with black velvet, or some other light-absorbing material. (If the maker is a family man he will have no difficulty in finding sufficient scraps in the wife's ragbag.) Rather thin glue is the most suitable medium for forming a permanent union between the wood and the cloth, and some little care should be taken to get the inner surface smooth, where the box touches the flap.

The next thing will be to get out the flap; this is simply a piece of thin mahogany or cedar; part of a cigar box will do admirably, this is what the writer has used. It should be about $\frac{1}{4}$ inch thick, and large enough to overlap slightly all round the box. This also should be covered both sides with black velvet, and then comes the only part of the construction that offers the slightest difficulty. This is the hinging of the flap to the box.

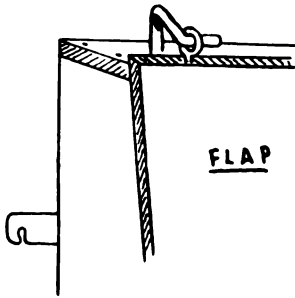


FIG. 2.—Detail of loose hinge—*D*, *D* and *E*, *F* in Fig. 1.

The first shutter made was fitted with a pair of ordinary hinges taken from a small box that had been in use for years, the result was that when finished the shutter worked very sweetly. For the second shutter, however, a pair of new hinges were obtained from the local ironmonger, and these, despite the use of oil and gentle persuasion, still remained too stiff to be of any use for practical work.

A capital and perfect substitute for hinges was therefore made as follows: A pair of small screw eyes ($\frac{1}{2}$ inch) were screwed into the flap (*D*, Fig. 1) and a couple of ordinary inch-wire nails were then bent and driven into the box at *E* and *F*, the flap then slipped into its place on *E*, while the nail *F* was slightly twisted out of place. The flap being in position on *E*, *F* was turned back into position, thus retaining the flap permanently in its place. Fig. 2 will make this clear, and show how the screw eyes should butt up against the inner side of the bent nails, *E* and *F*.

Now for the method of attaching to the camera, and the means of actuating the flap. The first shutter was attached by the well-

known "hook joint," the two hooks being filed up from part of a brass spring from a disused printing frame. One of these hooks is clearly shown at *G*, Fig. 1. The shutter is held in place by being slipped over two round-headed screws let into the camera front inside.

In the case of the second shutter, it was simply held in position in the camera, and a couple of screws driven through the camera front into the top and the bottom of the box. The latter is the simpler, and, if the very slight disfigurement offered by the two screw-heads is not objected to, on the whole the better plan, as there is no danger of the shutter jerking off with constant use, which might conceivably happen in the case of the hook-joint fastening.

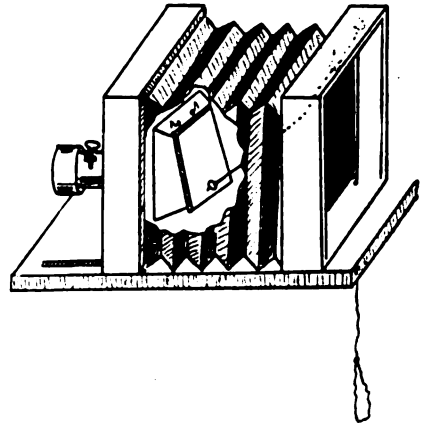


FIG. 3.—The shutter in use—opened by drawing string and closed by releasing the same.

The method of working the shutter is so simple that a glance at Fig. 3 should make it quite clear, but a few words of description may be necessary. It will be noticed that three small screw eyes, and a piece of string, are all that is wanted to complete our apparatus; the first eye is screwed to the flap near the lower edge; the second is screwed to the inside of the camera back at the top; the third is screwed to the camera back at the right-hand top corner. A hole is then made right through the back and baseboard directly under this last eye, and the string threaded as shown in Fig. 3. A long, moderately fine bradawl is just the thing for making this hole, and as regards the string, I find that the thin red twine used by chemists for tying up their smaller parcels is very suitable. I have made over five hundred exposures with my last shutter so fitted, and the twine as yet shows no signs of wear.

At first sight it may seem rather a dangerous proceeding to make a hole in the camera, particularly so close to the dark slide; in fact, the writer was at first inclined to fear fog from the light creeping through, but he has never had the slightest trouble from this source, and a moment's reflection will show that if the hole is made at a slight angle (inclining toward the lens), the worst that can happen is a dull pin-hole picture of the studio floor projected on the top of

the camera bellows, and what little of this is reflected on to the plate is so weak as to have absolutely no action. In the case of a very light floor-covering being used, a small piece of black velvet might be glued under the base-board and a hole made with a bodkin or other suitable tool for the passage of the string. This would effectually trap any light, but as indicated above, this is really quite a needless precaution.

With the shutter thus made, an exposure of any duration from about one-eighth second upward can be given, and the few examples of child portraiture reproduced will show that this is short enough for securing really natural pictures of the one-time "photographers' terrors." As regards longer exposures, there is not the slightest difficulty; simply hold the string fairly taut and count off the requisite seconds.

For exposures running into minutes, and for focussing purposes, the following simple arrangement is used, and is (in my opinion) far superior to the usual tap and bulb, which often develops a slight leak, slowly shutting up while focussing is in progress.

An ordinary cork from a medium-sized bottle (say, 10-ounce) is cut in half and screwed to the camera stand in any convenient position; a thin wedge-shaped slice is then cut from it somewhere near the middle, and the string simply pulled into this wedge-slot—the shutter will then remain open for any length of time.—*British Journal of Photography.*

Red Bromides

FOR the production of what is known as the "red-chalk" tone, the favorite formula has hitherto been one requiring in its make-up a large proportion of neutral potassium citrate, a chemical not usually stocked and consequently unhandy to obtain at any time, now, in company with most other potassium salts, only to be had at a very enhanced price. The writer has therefore been led to make trials in other directions, and is now able to give particulars of a method of producing red tones of a particularly pleasing nature, with sparkling high lights, the print being free from the dull and sunken aspect hitherto characteristic of copper toning.

To those who are contemplating the production of red-chalk pictures for the first time, it may be well to say that in the case of most subjects, landscapes particularly, the bromide print must be exposed and developed to such an extent as would render it useless if left in the black; this, indeed, is one factor making for the superiority of the red-chalk print over one in black-and-white from the same negative.

Granted that the negative one is working from is robust and well graded, the extra exposure enables the entire scale of gradation to be recorded on the print, which in the subsequent process of toning loses its heaviness and becomes a thing of charm.

The toning bath is made by dissolving

Copper sulphate	20 gr.
Potass. ferricyanide	10 gr.
In water	3 oz.

This produces a muddy greenish fluid, to which is added sufficient of a saturated solution of ammonium carbonate to dissolve the precipitate and leave the solution a clear, slightly greenish blue. After this stage has been reached, another half an ounce of the ammonium carbonate solution is added. The ammonia salt being of a very volatile nature, the quantity required will vary according to its condition: if fresh, about 200 grains will be required, and this is represented by two fluid ounces of the saturated solution.

The bromide print, which has been fixed and washed in the usual way, is flowed with enough of the toning solution to cover it, and passes through a series of colors of increasing warmth. In the early stages some most agreeable purples are produced, and, of course, the operation may be arrested at any moment; for red tones, however, the print is allowed to remain until action ceases, when ten minutes' washing follows. It will now be seen that a slight pink tone pervades the high lights, and this is removed by a brief immersion in

Liquor ammonia (strong)	30 drops
Water	6 oz.

Used in these proportions this clearing bath will not affect the density of the print; used stronger it will, so that means of local or general reduction are at hand if required. After another five minutes' washing the print may be laid out to dry.

The toning solution may be used for two prints in immediate succession; after that it should be thrown away. The cost is trifling—about three cents for the five ounces.—*Amateur Photographer.*

Concerning Second-hand Apparatus

WITH most of the old photographers, amateur as well as professional, there was a kind of sentimental regard for any piece of apparatus which have done them good service, and they would no more have dreamed of sending one of their old cameras or lenses to the auction-room or second-hand dealer than the fox-hunter would doom his favorite mount to the shafts of a "four-wheeler." This feeling is now, however, in a fair way to become extinct. Improvements and modifications succeed each other so rapidly that the progressive worker has hardly time to become attached to a piece of apparatus before it is more or less out of date and has to be superseded. A glance at our advertising columns will show on what an extensive scale this changing of apparatus goes on, and a few words of caution and advice may be acceptable to many of our readers. In the first place, it should be remembered that even the best of apparatus cannot be used for any considerable amount of work without requiring a thorough overhauling, and a would-be purchaser should always make a point of having every article examined by a skilled workman before closing the bargain. As an actual instance of the necessity for this precaution, we recall a case in which a photographer paid a good price for a half-plate focal-plane camera, which he required for press work.

A close scrutiny did not reveal any defect, and a trial plate or two gave satisfactory results; he was quite satisfied—for a short time. At the end of a fortnight some of the slides became leaky, and on submitting them to a camera maker it was found that the light-traps, which were of metal, were so corroded that they were practically crumbling to pieces. These had to be renewed at considerable cost, and again all seemed well. Not long after this the shutter slowed down in an unaccountable manner, and on returning it to the makers it was found necessary to fit a new mainspring, the old one having lost its resiliency, though, temporarily tightened up for the purpose of sale, it appeared to be in good order. Altogether these repairs cost over ten dollars, to say nothing of the loss of time and the inconvenience to the owner. The expert overhauling would have transferred this loss from the buyer to the seller, who probably would have been quite willing to pay for repairs which were proved to be necessary. In the case of lenses by makers of repute, and for which a fair price is asked, it is advisable that they be submitted to their makers for a report on their genuineness, and also their present condition. Most makers will render this service for a very small fee. If the purchaser relies upon his own judgment, he should not forget to examine the surfaces, to see if the polish is intact. If this is in any way dulled, it will cause a general fogging of the negative, which is more noticeable in bright weather than in dull.

At the risk of being tedious, we must repeat the caution against sending money to strangers who advertise bargains in apparatus either in our own or other columns. Without any intention to be dishonest, the seller is apt to describe his goods in too glowing terms, and the camera "in condition as new" may be found to be well worn, though serviceable. But besides these, there are actual swindlers who have no goods to send, and the hardly less reprehensible ones who have "just sold" the article advertised, and send as near a substitute as possible. To recover a remittance from these gentry is, in the words of the proverb, "like getting butter out of a dog's mouth." However, anyone who is defrauded in this way has no claim for sympathy, as all reputable journals with "apparatus-for-sale" columns arrange to hold money on deposit until the goods have been accepted as satisfactory. In the case of photographers, the ordinary references to their stock dealers may be exchanged, and some such precaution should always be taken.—*British Journal of Photography*.

Simple Background Painting

No matter how good a background may be, a photographer, in working with it every day, soon grows tired of it, and even when there are a few to select from the time comes when something new must be introduced. To the country photographers, whose sitters are few, the expense of a complete renewal is often more than can be faced. To such I would say, have a try at painting some new effects on the top of those you have completely done with. If the subject selected does not require too much detail, there

is nothing to hinder anyone painting a number of backgrounds all different, and so to keep continually altering and renewing the designs, with the result that his work will look newer and of greater variety, since with a number of small grounds he can ring the changes so as to use a different background, or even the same one used in a different way, with almost every sitter. No ground need be worked to death, but just painted over agzin.

There are various methods of painting backgrounds, but the simplest is the distemper method, using either a commercial distemper or a special preparation sold for the purpose by the Vanguard people, or, lastly, home-made whiting and black, the two mixed together to make a middle tint. A large pail of good glue size should be made up first, and, say, half a pound of treacle mixed with it to make it more plastic. This size and treacle mixture is the medium used to make up the distemper. A pound or so of fine whiting is taken and ground as fine as possible, and size added until you have a smooth-working mixture.

Three or four ounces of drop, lamp, or ivory black is also ground and made into paint with the addition of size (in another pot, of course). A little red color should be added to the black to make it a nice warm color, and also a few grains to the white to take away the harshness. Take a third pot and mix two parts white and one part black from the pots already made up. This gives you your middle tint. After you have got so far, take a strip of cardboard and paint some of each tint on it and let it stand until dry. You will then see if the three tints are of the strength you would like the background to be. To modify them you add a little white to the black and then a little of the black to the middle tint. This brings them closer together and gives less contrast.

Before starting to paint, the cloth should be evenly hung against a plain level wall (outside if it can be managed, as a bit of a mess will be made). If you have a frame or stretcher, all the better, but they can be painted hanging quite well. The cloth being hung or stretched, the first thing to do is give the whole surface a coat of size. This puts the canvas in good condition for working. This done, take a small brush and some white, and sketch in the principal masses and proceed to lay in your color, working from the top downward and merging one tint into the other, leaving no hard lines. The masses being all laid on, proceed at once to put in the details. Nothing very strong nor fine must be attempted at first. Broad, soft working is what is required, and, remember, a ground must be finished before it is allowed to dry. It is a good plan to start with a small head ground, as one can reach over the whole of it at once. Take the lightest tint and put a good large patch of white right in the center and a little to one side. Then take the darkest tint and lay a wash of it all round the edges, working in to within six or eight inches of the white in the center. Then take the middle tint and cover the space between the dark and the light color. A large brush should then be taken and the cloud formation worked in, using only the color

that is on the ground. This is simply a matter of blending and softening the one tint into the other with a circular motion of the brush, care being taken to leave no hard brush marks. A graduated ground can be done the same way. Start with the lightest tint at the top, then the middle tint, and lastly the darkest at the bottom. This can be carried further up at the one side if desired. In putting on the middle and dark tints rough cloud formation should be aimed at. Then the whole thing should be gone over with a softener as before, and the tints softened into each other. Painting any of those backgrounds is so simple that a child could do it if it had the strength to handle the brushes. The whole secret of success is in keeping the entire surface soft and in working condition until finished, allowing it to dry all at once. If not up to expectations, give it another coat of size and do the whole thing over again.—*British Journal of Photography*.

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Rescue Work among "Hopeless" Negatives

THERE are few photographers who have not a little store of negatives from which it is impossible to make a print by straightforward methods. They, indeed, appear to be quite worthless, yet there is always a lingering idea that something may be made of them some day. Other workers of sterner fiber only cherish the memory of hopeless exposures which they threw away at an early stage in their history. Chief among such negatives are those which suffer from errors of exposure, extreme over- or under-timing having rendered them incapable of giving even a passable print by any known method.

Let us first take the case of an extremely under-exposed negative which is so thin that it cannot be intensified with any hope of success, and yet is not fogged or stained. In such a case a very fair copy may often be made by bleaching the ghostly image with bichloride of mercury, backing up with black velvet, and copying in the same way that a collodion positive or Daguerreotype is treated. It must be remembered that the glass side of the negative is to be turned to the copying lens or a reversed image will be produced. Such a thin negative will sometimes yield a fair print if copied upon "contrasty" gaslight paper in the camera, or by the use of an enlarging lantern. I have found it possible to obtain contrast in this way from negatives which would not stand the shortest exposure in contact printing. Of course, the illumination, whether it be daylight or artificial, must be very subdued in character. Such prints should be developed with a strong solution, so that full strength can be obtained without the risks of straining which is always present when one is attempting to "drag out" an under-exposed image in a weak or normal developer.

If a thin over-exposed negative has to be dealt with, the best way to proceed is to intensify with a freshly made uranium solution, a good formula being: Uranium nitrate, 10 grains; potassium ferricyanide, 10 grains; glacial acetic acid, 24 minims; water, 1 ounce. The negative, which must be free from hypo, is immersed in

this solution until it has assumed a red color, which is very non-actinic. The clear portions will be stained a light yellow, but this may be removed by washing in water acidified with a little acetic acid—say, 1 dram to the pint. The characteristic of the uranium intensifier is that it tends rather to clear the shadows while giving a maximum density to the lights. As this density depends upon the color of the deposit, a stronger print will be obtained by daylight printing than by exposure to gaslight. If a transparency has to be made, an ordinary plate should be used, and if possible a blue screen interposed somewhere in the path of the rays; a piece of common blue glass will answer if placed in contact with the negative.

A thick over-exposed and over-developed negative in which the image is only visible by a strong light is best treated by reducing with ferricyanide and hypo, and subsequently intensifying. I have succeeded in reproducing such negatives by using an ordinary plate for the transparency, and exposing it under the negative to good daylight. The transparency is intensified, if necessary, and the new negative made on a slow plate by contact.

A class of negatives which often calls for rescue work consists of those which have been intensified with mercury and have faded to a sickly yellow color. These may be restored to their full density by immersion in a bath of sodium sulphantimoniate (Schlippe's salt) 15 grs., water 1 oz. This must be freshly made, and the crystals of sulphantimoniate washed before they are dissolved.

Negatives which have been imperfectly washed are often covered with a deposit of dry hypo, which will ruin any sensitive paper it comes into contact with. The best way to deal with these is to interpose a thin sheet of celluloid, as when printing from wet negatives. It is unsafe to attempt to re-wash such negatives, as the whole film is very likely to frill off the plate and vanish down the waste-pipe.

The orange stain due to imperfect fixation is difficult to remove. Sometimes it will give way to a weak solution of potassium cyanide, but I prefer to intensify with mercury and ammonia or mercury and cyanide of silver, when the yellow stain is turned into a gray one, which has little printing value. Stains caused by absorption of silver from the printing paper are easily removed by rubbing them with Globe metal polish (paste) and immersing in a strong clean hypo bath. If the stains are old, the negative may have to remain in the hypo bath for an hour or more, but I have never found a case in which this remedy failed. Patches of uneven density caused by alteration of temperature during the final drying of negatives are very difficult to deal with, no amount of soaking seeming to have any effect upon them. I have found that the best way to deal with plates affected in this way is to coat the back with Billdup or matt varnish, and to stump over the thin places with fine black-lead powder.

Surface tarnish, which is usually due to exposure of unvarnished negatives to gas fumes, is easily removed by rubbing with Globe metal polish, or, in mild cases, with methylated spirit.

There are many negatives useless as a whole which still contain the makings of a picture if the best portions be enlarged, and for this reason among many others I recommend every photographer to keep an enlarging apparatus ready for use. As a case in point I remember taking a number of negatives of a well-known clergyman. In one of these, a three-quarter length, he moved his hands badly and the plate was put aside. Some time after, in looking over the "spoils," the expression struck me as a good one and I enlarged the head to twelve by ten. This was submitted, and resulted in orders many times the value of the first one from the "good" negatives.

The "sketch" style also lends itself to the rescue of faulty negatives, for if the face be intact it is easy to draw in the body. For those who are not skilful in getting good proportion the head may be printed to full strength and the figure to just such a depth that it will serve as a guide for the brush or pencil work. There is yet another "fake" which is useful in desperate cases, and that is to turn the photograph into a pen-and-ink drawing. There are many ways of doing this, but with the materials now in use there is no better one than to make a light print on platino-matt bromide and carefully draw upon it with an ordinary pen and waterproof drawing ink, only putting in the principal features. Expose the drawing to the light and air for two or three hours to harden the ink, and then bleach in the ordinary iodine and cyanide reducer, rinse well, and after drying put in the finer details with the same pen and ink. If too much detail be put in before bleaching the drawing is likely to look heavy, as a light stroke does not tell on a print as it does upon the plain white paper.

It is, of course, obvious that much "rescue work" can be done by the ordinary methods of intensification and reduction, but in such cases the negatives cannot be regarded as hopeless, while methods for mending cracked and broken negatives have only recently been described. We must not forget, however, the old trick of printing a cracked negative on a table suspended from a roasting jack; or, failing a roasting jack, a skein of worsted. When printing in bromide the printing frame must be kept in movement all the time with a rocking as well as a circular motion. This effectually prevents the shadow of the crack from printing and there is only the fine line of the broken film to touch out. If the edges of the crack are ragged they should be touched out with opaque color, as it is not easy to spot out black lines or patches.—*British Journal of Photography*.

Tools and Their Users

THERE is an old adage which says that "a bad reaper never has a good hook," a bit of proverbial philosophy which has an application to photography as well as many other fields of work. At first sight it seems to be directed only against the indifferent workman, but in reality the proverb is double-edged, for while it is a fact that no perfection of appliances will make a bungler into an expert, yet imperfect

or unsuitable tools will handicap the most skilled hand more or less. This is very noticeable in the case of the studio. The clever operator will manage to turn out creditable work under conditions which would be disastrous to an indifferent one, and on the other hand an easily managed light has made for many a man a reputation which he has not been able to maintain after a removal to other premises. "Sweet are the uses of adversity." The man who has had to battle with a top-lighted studio expose to sunlight during a great part of the day is hardly likely to fail where the conditions are less trying. It is, however, a great mistake for anyone to continue working under adverse conditions when there is a possibility of improving them, for the exhibition of skill in such a case reminds us of a violinist who can play a difficult solo on one string, while he has four on which he could do the same thing more perfectly always ready to his hand.

It is even more important that the operator should be *en rapport* with his apparatus than with his light, for while the latter may affect the finished result it has not the distracting effect of a badly working camera. The ideal condition is when the operator is absolutely unconscious of the working of his apparatus; when he can use it with the same absence of effort with which he manipulates his knife and fork, or puts on his hat and coat. Then he is able to concentrate his attention on the sitter, and to do his best from the artistic point of view. How many good pictures have been spoiled in the making by leaky shutter fittings, slides which fit too tightly or too easily, racks which jamb or jump, and stands which refuse to go up or down at the critical moment? In sports and athletics this factor is recognized to the full: the oarsman is not allowed to worry about his boat, it is put into perfect trim for him by his trainer or other friends; the boxer has to take no thought as to his training quarters or the hall where the contest will take place, his only care is to be fit when the time comes. The photographer needs to be as fit as any man if he is to do his best work, yet he has usually many burdens, and he has the whole financial responsibilities of his business. He has to deal with the whims and often the impertinences of his clients, therefore it is doubly necessary that he should not be handicapped by his tools. Every operator should keep his apparatus "tuned up" to the highest point of efficiency so that he may feel the same confidence in it that the aviator feels in his aeroplane or the "sniper" in his rifle. It is not a costly business to do this; a few hours' work will remedy most ordinary defects, and much of it may be done by the photographer himself. The country photographer may have some difficulty in getting repairs and adjustments made, but it is better to put up with a considerable inconvenience for a week rather than to have a chronic state of worry over make-shifts.

The quest for efficiency should not end in the studio; the dark-room and the workrooms have also a claim for consideration. In many dark-rooms the expenditure of a single sovereign would make an enormous difference in the

efficiency of the equipment, while a five-pound note would work wonders.

As it is with apparatus so it is with plates and materials. No idea of small economies should be permitted to interfere with efficiency. The plate bought on the best terms may be the dearest in the end, and the "substitute" used for development may have weaker reducing power than the genuine article.

One great point in securing efficient work is to let nothing lie about in an unusable condition. Printing frames with doubtful springs, a dry-mounting press that gives uneven pressure, and tissue that only sticks sometimes are easily remedied or replaced. We need not tell any business man that it is his duty to look for defects and deterioration in his plant and not to leave it to his staff to formulate their requirements; often employees fear a rebuff if they make suggestions which involve the smallest outlay, and a very injurious atmosphere of *laissez faire* is engendered.

What we ask all photographers to do is to go round with a card and pencil and make a note of all work which needs attention, and then without delay to give it that attention. One essential condition of success in artistic work of any kind is that there should be no avoidable obstacle between the idea and its realization, granted, of course, that the idea and the capacity to carry it out exist. It is perhaps as well that success after all depends upon the man and not upon his appliances, else many a young artist would be crushed by impecuniosity at the outset of his career. We can recall the case of one successful exhibitor whose one and only camera was a 5 by 4 Kodak of an old type, but he steadfastly declined to get a larger or better instrument, because, as he said, he knew exactly what he could do with the old one. Other men have different views of the question, and to many the possession of the most perfect equipment is of itself an inspiration. The very worst preparation for work is a feeling that one has got to be careful lest some fault in the apparatus is going to cause failure, yet this feeling exists in far too many cases.—*British Journal of Photography*.

To Remove Wrinkles from Backgrounds

WRINKLES from any cause whatever (provided the paint is not cracked off) may be removed and the background made as smooth as though it had been painted on your frame or stretcher.

New backgrounds are often wrinkled by the ignorant while they are being mounted on the frame, by the fingers touching the back or the front of the background when it is being unrolled. Avoid touching the ground and never squeeze or crush it with your fingers, let it rest gently on the open palms of your hands; while your assistant tacks the top to the frame, first one end, then the other end, and then working from the center to both ends of the top at the same time. This should be done with the frame standing upright. Never lay the frame on the floor to stretch a background as you will probably ruin it.

After the top is tacked begin on the sides at the bottom and work upward. Do not drive

any of the tacks all the way in, you may have to remove them to smooth out any sagging or wrinkles. Then if the background has no extension tack the bottom. All tacks should be about six inches apart.

Wherever any sagging or wrinkles appear, remove the tacks one at a time, stretch the ground gently and replace the tack, working toward the nearest corner. Do this until your ground is as smooth as if painted on your frame. If, however, this is not accomplished by the above, place the background on two or three chairs face down and place a pail of boiling water underneath (keep the water steaming) for an hour, then stand the ground upright and stretch out any sags or wrinkles as before, as the paint will have become softened enough to allow you to do a good job this time. Then drive the tacks all home.

If your ground has an extension, lay a strip of board along the bottom edge and nail through it to the frame to hold the ground until it is thoroughly dry, which will take twenty-four hours, when the strip can be removed. The nail holes will not show in the photo. Have the nails six inches apart—as you did the tacks or the ground will shrink unevenly.

If you use a background carrier for your grounds, you will have to mount them on frames first and proceed as above. Allow them to dry thoroughly, when they may be removed and remounted on the carrier rollers. The wrinkles will again shortly re-appear. Can't fix them.

To remove small indentation, spray the background gently with an atomizer containing water which has been boiled and allowed to cool. In fact, the atomizer may be substituted for the steam process if you care to take the time necessary to accomplish the result.

Before trying this process on an old ground be sure to dust it thoroughly or it will stain. Brush it vigorously with a soft feather duster until every particle of dust is removed.

To save a background that has been water-stained, if you discover it before it has begun to dry, lay the ground down on the floor and flood it with clean water. Do it quickly and all over, but do not attempt to use a brush or cloth to cover parts you failed to get wet—pour water on them. Then stand it up and allow it to dry. All sides must be tacked as in method for removing wrinkles. This will often save a ground that otherwise would be hopelessly stained. Remember though that nothing will remedy the stains once they are dry at their edges. Paint will not even cover them. I have, in experiment, removed all the paint and repainted stains twenty times by actual count, and the stain came up as strong through the last coat of paint as it was before I touched the ground.

The Best Type of Negative

The old question of the best type of negative for bromide printing has recently popped up once more in our answers column, and the trouble of the querist seems also to be a very common one, namely, that the negatives he gets, though they yield good results on gaslight

paper, will not serve for bromide, and become too foggy if he tries to develop them more. It is a somewhat unfortunate fact that thin foggy negatives can be printed on gaslight paper, for it has rather encouraged the production of such negatives. It should, however, be better understood that foggy negatives are not the best for any kind of printing paper, and that even gaslight paper will yield better results with clean negatives than with foggy ones. The too prevalent fog is caused, generally, either by using very fast plates that fog readily if not treated with special care, or by neglecting the use of bromide in the developer, without which most plates will fog more or less easily with such developers as the popular metol-hydroquinone. The fog should not be there in any case, and the only special quality in the negative that is really required for the production of good gaslight prints is moderate thinness. A negative exactly suited to gaslight paper should also be eminently well suited to bromide enlarging in a lantern with a gas illuminant, but such a negative will in most cases be somewhat too thin for bromide contact printing, unless a slow paper is used.

Contact printing on bromide requires a negative of much the same quality as all the other contact processes, with the exception of gaslight, though it must not be forgotten that the introduction of "soft" and "hard" or "vigorous" qualities of gaslight paper has to a considerable extent rendered this paper useful with very varied types of negatives. A negative just suited to enlarging should give an excellent print on hard paper, while one suited to the making of contact bromides will generally give good prints on soft gaslight paper.

For enlarging on bromide paper it is generally advisable to prepare negatives that if not specially thin are at any rate not too remarkable for pluck and vigor. A good platinum printing negative, though it will also yield a good contact bromide print, will almost certainly be too strong to enlarge well in a lantern unless a very powerful light is available. With an arc it will give an excellent enlargement, but with incandescent there will be a difficulty that will not be satisfactorily overcome by extra long exposure. On the other hand, it must be admitted that we occasionally come across negatives of a quality that enable us to use them equally well for any printing or enlarging process. Examination will generally show that in such negatives, while there is no lack of vigor and contrast, yet the heavier densities, that is the lights, are broken up at very small portions. The enlarging trouble arises chiefly when the lights are grouped in masses of heavy deposit and not in separated small details. Therefore, while a universally useful negative is a very desirable and convenient thing, it is one that we cannot ensure getting unless the subject is just suitable.

Fortunately the average worker does not want to use a great variety of printing processes for one and the same negative, hence, on the whole, it pays him best to prepare negatives suited to the particular processes he means to use. This generally means that some printing methods require the negative to be developed

for a little longer or shorter time than others. In no case does it mean that a foggy negative is a desirable one. Fog is always a thing to be most carefully avoided, and it is quite easy to avoid if very moderate care is given to the matters of exposure and development.—*British Journal of Photography.*

Direct Positives on Bromide Paper

FOR rapidly copying documents, articles in journals, line drawing, etc., a direct photograph on bromide paper is very satisfactory if the photograph is made through a prism to avoid reversal. A well-known example is the use of the Photostat machine, in which the operations of development and fixing are performed automatically after exposure in the camera, the paper being cut off from a roll, so that a great number of photographs can be taken in succession. This method, of course, produces a negative, and for much work a negative has no disadvantages. On most occasions, however, a direct positive is desirable, and such positives can be obtained on the bromide papers used for copying work, by two different processes.

The first method is the well-known one whereby the developed, but unfixed, print, is bleached out in an acid permanganate bath, and the residual image of silver bromide exposed to light. This, on development, gives a positive black-and-white image. Good results are obtained by observing the following instructions:

The exposure must be sufficient so that development is complete in about two minutes, using the developer recommended for the particular paper used. After washing the print for five minutes it must be bleached by bathing for one minute in the following bleach bath:

Potassium permanganate	30 gr.
Sulphuric acid (strong)	150 min.
Water	32 oz.

Rinse and immerse in a dilute solution of sodium bisulphite to remove the brown stain, working in full daylight, and rinse and develop in the developer first used; then fix and wash in the usual way.

Any slight stain that remains in the print can be removed by bathing in a weak solution of potassium cyanide, being careful to take the print out the moment the stain disappears, or the silver image itself may be attacked.

A second method, worked out in the research laboratory of the Eastman Kodak Company, calls for developing in the usual manner, converting the unexposed silver bromide into silver sulphide and then removing the residual silver image, leaving a positive image of silver sulphide.

The exposure may be made in an ordinary plate holder, keeping the paper flat with a sheet of clear glass, and must be adjusted so that development is complete in two to three minutes in the following developer at 70 degrees F.

Elon	8 gr.
Hydroquinone	150 gr.
Sodium sulphite	3 oz. 100 gr.
Sodium carbonate	3 oz. 100 gr.
Potass. bromide	50 gr.
Water	32 oz.

This developer will keep well.

It is evident, in view of the fact that this developed silver image is subsequently removed, leaving a clear white background, that all the exposed silver bromide must be reduced to silver during development, or the high-lights of the final positive will be stained or fogged. On the other hand, if the print is over-exposed in the first place, spreading may take place and fine lines will be lost.

After development a rinse only is needed before the print is put into the darkening bath, where it remains for two minutes at 70° F., when the unexposed silver bromide is converted into sulphide. The bath is made up of:

Sodium sulphide (crystal) 1 oz.	330 gr.
Water	32 oz.

It will be safer to bring this solution to the boiling-point and allow to cool before using, in order to precipitate the iron present. The final color of the print, as well as the degree of contrast, will depend on the strength of this bath, which may be used almost indefinitely. A weaker solution will give yellowish-green tones, but if the above strength of the solution is maintained, almost black lines are obtained. Rubber fingertips should be worn, as the solution may affect the finger nails.

The print, after a few seconds' washing, should be placed in the following bleach bath until the high-lights are perfectly clear, which will occur in about three or four minutes:

Potassium ferricyanide	11 oz.
Ammonium sulphocyanide	11 oz.
Water to	32 oz.

The temperature of the bleaching bath is important. It may run from 65 to 75° F., but it should not go beyond this, or the silver image may be attacked and the bath is liable to decompose. The bath ripens with age, and works best when it has turned a greenish color. Ammonium sulphocyanide may be replaced by the potassium salt without changing the action.

In view of the fact that ammonium sulphocyanide dissolves silver bromide, the print is automatically fixed during bleaching. After bleaching, the print should be well washed for five or ten minutes and dried as usual.

The finished print will have a slightly yellowish cast in the high-lights, which can only be removed by continued use of the ferricyanide bath, which is not desirable. Local yellow stains are due to the presence of silver bromide along with the silver image previous to sulphiding. It is important, therefore, to prevent this by correct exposure and full development. At all stages of the process the print must be

agitated to prevent stains caused by uneven action of the baths.

In actual practice the process takes very much less time than is taken to describe it. Not more than twenty minutes are needed to carry it through, including the developing, sulphiding, bleaching and washing.—*British Journal of Photography.*

Preparing Negatives for Printing

It may happen that after a negative has been made (at times miles have been traveled to secure a particular scene or view), that through some defect it is found that the negative *must* be "doctored" or "dodged," as it is sometimes called, so that a good print may be made from it. One cause is through the plate being unevenly coated, so that the negative is much thinner at one end than it is at the other, this has caused an unequal density, which only becomes visible upon development. Another cause is due to the developer having flowed unevenly over the plate, or that the plate has been unequally covered with the developer by some slight mishap in the dark-room, which may have brought about patches showing the unequal development, or it may be that the negative needs only a little intensification at one end, where the usual method of intensifying would bring about more density at the thick end while it was needed only at the thin end. Where any of the above defects occur they can be remedied in a very simple way. Clean the back of the negative well from dried water marks, or emulsion spots, and coat this cleaned part with a varnish known as matt varnish, which can be purchased ready-made, or it can be made easily from the formula given here. If this coating of a plate has never been tried before, practice upon one or two clean plates, 4 x 5 will do; draining the excess off at one corner into the bottle again. Wipe the excess from the lower edge of the plate, then fan the plate dry with a sheet of cardboard. When the varnish has become set, it will possess all the appearance of finely ground glass. The plate should be warmed slightly to bring about a fine surface, it can then be worked upon in the following manner: Take an ordinary leather or paper stump the same as those used by crayon artists, rub an ordinary black-lead pencil upon a strip of ground glass, or apply a morsel of fine graphite, rub the tip of the stump upon this, then proceed to work upon the matt varnished face of the negative over the part or parts that are less dense than the rest of the negative. This is easily accomplished by placing the negative against a window, or better still in the frame of a retouching desk, so that the progress of the work may be seen. It will soon be observed that the black-lead applied in this manner causes an evening up of the defective part or parts of the negative, and being done upon the back of the negative instead of the front, the thickness of the glass aids in producing necessary effect without any decided edge showing where the correction has been made. Whenever it happens that the negative is a little thin, and the sky becomes printed so deep that

it mars the other good qualities of the negative, the ground glass varnish, as it is frequently called, serves an excellent purpose, by enabling anyone to make up a clouded sky; with a little care the clouds can be worked upon the negative to suit the operator, or, better still, to represent natural clouds to suit the scene or view. Again, in this instance it will be found that the thickness of the glass aids in giving just that softness and cloud effect produced by nature.

If the operator wishes to make his own varnish instead of purchasing it, a varnish that is equal in quality to any that is made commercially, the formula given will meet every requirement. A clean ten-ounce bottle, well dried, should be used in this place.

Sulphuric ether	4 oz.
Benzole	2½ oz.
Gum sandarac	180 gr.
Gum mastic	40 gr.

The bottle and its contents must be shaken occasionally until the gums are dissolved; when dissolved the varnish must be filtered to rid it of small chips and possibly insects. This varnish will give a very fine grain upon the negative, a coarser grain can be made by the further addition of benzole. The right quantity to cover the plate will soon be acquired by practice. Should some of it flow over the face of the negative, this can be easily removed by moistening a pellet of absorbent cotton in a mixture of benzole and ether, or benzole alone.

The application of matt varnish to a portrait negative will oftentimes give several advantages. In the first place, it causes perfect diffusion of light, thus producing beautiful prints no matter whether the paper used be print-out or a developing paper. This diffusion of light brings about a delicacy not obtainable when the prints are made from the bare negative. The shaded side of a face prints too dark, all that is necessary is to apply a faint coating of graphite over that part with the stump.

In the case of groups taken on very bright days, especially out-of-doors, the shaded sides of the faces are decidedly improved by this simple method of treatment.

In fact, as far as local intensification is concerned, this is one of the easiest, most simple and effective ways of obtaining good results, without in the least degree injuring the negative.

This plan is far better than dabbing color upon the back of the negative to lighten up the shadows. There need be no fear of obtaining a sharp, decided line showing the "doctoring" even if prints are made in direct sunlight, as would be the case if a color worked-up negative was used. Working up a negative as described is better than working upon tissue paper stuck upon the printing frame. No amount of shifting the position of the negative will cause either a false light or shade, as would be the case with a fixed-up "dodging" upon tissue paper.

Simplicity, ease of working, and highly satisfactory results can always be secured by the above plan of "doctoring" up the negative.

PATENT NEWS

Under this heading it is proposed to include each month a list of all the U. S. Patents; and brief abstracts of the more important, and to include also such foreign patents as present special features.

Copies of any patent can be obtained from the Commissioner of Patents, Washington, D. C. Price, five cents each.

- Camera. W. S. Goldwire & J. F. Patton. 1224531.
 Camera Attachment. H. C. Wray. 1224588.
 Camera Device. C. A. Hoyt. 1224300.
 Printing Process. P. D. Brewster. 1224442.
 M. P. Apparatus. R. H. Pietzsch. 1224500.
 M. P. Machine. W. A. King. 1224309.
 Projection Apparatus. F. A. Loftus. 1224392.
 Projection Apparatus. W. L. Patterson. 1224663.
 Camera Attachment. W. P. Robinett & J. A. Gulladage. 1225495.
 Camera Attachment. T. Kruger. 1225652.
 Camera Attachment. A. Kiss. 1225039.
 Film Lubricator. E. R. Pearson & C. E. Jones. 1225270.
 Flashlight Apparatus. D. C. McCandless. 1225261.
 Printing Machine. J. H. Fulmer & R. W. Runser. 1225729.
 Coating Material for Paper. G. W. Leighton & C. S. Babcock. 1225146.
 Color Photography. H. Hess. 1225246.
 Process for Treating Photographic Media. S. H. Weinhandler & J. S. Simsohn. 1224984.
 M. P. Apparatus. L. Aikin & S. Adelman. 1225392.
 M. P. Device. M. Segel. 1225184.
 M. P. Machine. C. F. Jenkins. 1225636.
 M. P. Device. A. D. Covert. 1225222.
 M. P. Apparatus. A. S. Howell. 1225335.
 Camera Attachment. G. W. Bretz. 1225757.
 Camera Device. A. A. Ruttan & C. E. Hutchings. 1225861.
 Developing Apparatus. J. S. Greene. 1225803.
 Film Cartridge. H. L. Gray. 1225951.
 Film Cartridge. B. H. Meyering. 1225988.
 Photographic Apparatus. J. I. Crabtree. 1225929.
 Color M. P. Apparatus. M. Vandal. 1226282.
 M. P. Machine. J. Grant. 1225801.
 Making M. P. Film. R. V. Stambraugh. 1226135.
 Printing Frame. E. H. Hollister. 1225957.
 X-ray Tube. W. Robinson. 1226383.
 Camera. C. H. Eckerson. 1226955.
 Camera Device. R. D. Herschel. 1226660.
 Camera Device. C. H. Mansfield. 1226681.
 Camera Device. R. Kroedel. 1227276.
 Film Reel Shaft. C. Uebelmesser. 1227094.
 Film-tensioning Device. S. M. Coffman. 1227039.
 Plate Holder. A. A. Ruttan & C. E. Hutchings. 1227203.
 Drying Apparatus. V. C. Teneau. 1227092.
 Screen. A. F. Wolber. 1226838.
 M. P. Device. F. W. Hochstetter. 1226663.

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PUTTING YOUR BUSINESS UNDER YOUR THUMB

A SIMPLE SYSTEM FOR GETTING THE FACTS

By J. CLYDE WILSON

TOO much system is like too much mustard, it defeats its very purpose.

Nor can any system be said to be perfect. Every business has its own peculiarities, and every merchant or businessman engaged in that business encounters conditions peculiar to his particular establishment, which makes the hidebound application of even the best planned system impossible. With the photographer a complex series of records is not necessary. His is, for the most part, a cash business and, as a rule, a comparatively small business, employing a very few people or perhaps none at all. There are studios here and there, of course, which are exceptions to this rule, but they are few. The photographer usually has no elaborate pay-roll to maintain, with its time-sheets and piece-work records, no

heavy ledgers, fifteen-pound files, or ponderous stock sheets. His main interest, so far as records are concerned, is in keeping track of his receipts and expenditures and making sure there is always a balance large enough to yield a satisfactory profit.

On the other hand, there are other things which the photographer ought to know about his business. It is a notorious fact that professional photographers, on the whole, are none too prosperous. This ought not to be so. It used to be the case with the printers. A highly prosperous printer, making money and living in affluence, was a rarity a few decades ago. They all seemed to get along somehow, but they didn't seem to get very far, in spite of the great volume of business which was distributed between them. Then, one

(327)

6124	8/17/14.
Jones Mantle & Tile Co. 63 Fort St.	
(a) 1/2 doz Portraits in office Mr. J.	7 ⁰⁰
Prof-sum 8/18 - Ret. 8/20	
(c) 1- 8X10 photo. mantle #1643	1 ⁵⁰
(c) 1- 8X10 " " #1644	1 ⁵⁰
(d) 1- 8X10 " " #1645	1 ⁵⁰
	<u>11⁵⁰</u>
Unbilled	Paid
6 prints (a) - 8/24/14	7 ⁰⁰ - 8/24/14
(b), (c) + (d)	4 ⁵⁰ - 9/5/14
- 8/18/14	

Fig 1.

day, somebody discovered that printers were not making as much profit as they thought they were. Their work was costing them more than they realized, and they were not turning a decent margin on their investment. They were not basing their prices upon costs but each was charging "what the other fellow charged," presuming that what was good enough for the goose ought to be good enough for the gander. What happened? Everybody knows. Some of the brighter ones brought in cost accountants to find out just what printing cost. From that very day the great printing establishments one now sees on every hand in the big cities sprang up—monuments to careful figuring and exact knowledge of printing costs. Advertising and sales specialists have carried the investigation still further, discovering the exact status of the markets, the periods of depression and of sales heights, and have taken pains to stimulate business in dull seasons to keep the costs throughout the year normal and as a consequence the profits.

The photographer needs to know more about his business than he usually does. It is not enough that there is a favorable balance shown between the debit and expense column. Expenses will creep in, which require an expen-

diture of cold dollars, which are not at all apparent on such a record. Depreciation is one of them; waste is another—a tremendous item in photography. The writer was once employed in a studio of the better class, doing work of the very highest character, where approximately a third of each day's printing was thrown out by "the boss." Fortunately he was one of those photographers who realized the value of maintaining a high standard of workmanship, but he also knew that waste is a part of the costs and he charged for his pictures accordingly.

The value of any system for getting at the details of a business is in direct proportion to its simplicity. At one time the writer was shown the records of a small concern which had such an exact system for handling its orders that one could find at any time exactly when a job had come in, where it was at the moment of investigation, and when it would be done. If there was any failure to keep on schedule, the person at fault was automatically discovered and could be brought to task. It was splendid. Its only fault was that it cost so much in clerk-hire to maintain it that nothing was saved by it and it was an extravagance. It is such oversystematization which brings so-

APRIL 1915

DATE	REC'D TODAY	REC'D TOTAL	SPENT Today	SPENT TOTAL	NEW BUSINESS TODAY	NEW BUSINESS TOTAL	REMARKS
1	9 50	9 50	42 00	42 00	35 00	35 00	Clear
2	—	9 50	5 20	47 20	17 50	52 50	Cloudy
3	25 34	34 84	— 60	47 80	22 00	74 50	Fair
4	48 90	83 74	2 20	50 00	63 00	137 50	Grad. E.
5							(137.50)
6	—	83 74		50 00	12 40	149 90	Rain
7	21 00	104 74		50 00	24 20	174 10	Clear
8	16 00	120 74	— 18	50 18	27 00	201 10	Clear
9	24 20	144 94	14 80	64 98	32 00	233 10	Clear
10	9 00	153 94	—	64 98	16 00	249 10	rain
11	72 50	226 44	16 20	81 18	60 18	309 28	cloudy
12							171.08
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							

Fig 2.

called efficiency efforts into disrepute. Too much red tape is worse than chaos.

The system herewith outlined, though it lays claim to no perfection, should be suggestive to the more enterprising photographer. Truly, it does not give all the information concerning their business some photographers will want, but it may point the better way at least. As was said at the outset, each individual

business has its own peculiar conditions, and to meet these modifications will suggest themselves. On the other hand, it offers the advantage of being simple—its maintenance in good shape not requiring more than five minutes of one's time a day—and it does give the photographer a great deal of information he does not usually possess. For instance, do you happen to know exactly how much new business you have taken

Debits 1915 APRIL												
PORTRAIT STUDIO		PORT- AT Home	Comm'l Mfg.		Comm'l Bldg	Comm'l Miscell.	KODAK FINISHING		REMARKS AND TOTALS.			
4	50	12	00	8	00	12	00	1	50	2	00	COMPETING STUDIO OPENED
8	00	12	00	7	00	8	00	3	00	2	50	
7	00			3	00	6	00	8	00	6	40	STREET FAIR 6-10
8	00	18	50			7	00	7	00	9	00	
4	50	9	00	9	00			6	00	2	00	12 RAINY DAYS.
6	00	12	00	14	00			9	00	2	94	
6	40									6	20	
8	00											
52	40	63	50	41	50	26	00	34	50	31	04	248.94

Fig 3.

Fig 3.

in up to date this month? One can find that out of course from any set of books by doing a little figuring, but it is bothersome and easier left undone. Do you know how much, to the dollar, you have taken in and spent this month? Do you know whether or not you have had a falling-off in business this week as compared with the corresponding week last year, or last month, or even with last week? Do you know whether, for amount of business you did last month, you spent more for paper than you did for the same amount of business at some other time? If so, was it waste, or what was it? If you advertised this month, do you know if business was increased by your expenditure? These are things that are worth knowing, and imperfect though this system may be it will at least give you all of this information. But I assure you the more elaborate you make it the quicker you will discard it. The tendency is to overdo these things when we go in quest of the ideal. For our own part, we find plain ruled cards answer every purpose and permit some flexibility, as experiment dictates the best spacing to use. We write our orders as shown in Fig. 1. This gives us all the information we desire. We have a complete record of deliveries and payments and detailed information concerning each

negative, with space for more if desirable. The little wooden file in which the cards are placed takes up very little space in the desk, much less than would a register; it contains only live orders and is decidedly convenient. When an order is completed—all the deliveries having been made as well as the payments—the card is temporarily removed to the back of the file, from which each night the completed cards are taken, and after the debits have been entered in a journal removed to a completed file. Here arranged alphabetically they remain permanently, each file holding the complete year's orders.

In Fig. 2, we have a sort of daily recapitulation. Each day's receipts, expenditures, and new orders are entered upon this sheet, the same being added to the preceeding day's totals to date, so that we always know the total business we have done at any time during the month, as well as the actual receipts and expenditures—good, worthwhile information. Ruled paper can be purchased upon which to keep this record, but as only a single sheet is used a month it isn't much bother to rule it yourself. They may be conveniently kept in a loose-leaf ring-book so that they may be shifted about at will for convenience. The notations under the "Remarks" heading are interesting

EXPENSE. 1915 APRIL											
Over-Head	Plates		PAPER		Chemical		Mounts	Salaries		Miscell.	Totals
40 00	24	00	35		25		60	18	00	05	
6 00		65	42		3 10			18	00	64	
3 50	1	92	68		70			18	00	1 81	
25			4 50					18	00	12 20	
1 25	1	32	19 00					18	00	18	
51 00	27	89	24 95		4 05		60	72	00	14 88	195.37

Fig 4.

as throwing light upon some of the entries: The weather, a graduation, and other matters have an effect upon the photographer's business that should be noted.

In Fig. 3 and Fig. 4 our method of entering receipts and expenditures is shown. By this method of entry we are able to observe very easily what side of our business is largest in volume, on the one hand, and to note where most of our money is going—when it isn't

going into our pockets—on the other; We know—by comparing the expense columns from month to month and our gross debits—whether there has been waste of plates or paper or chemicals. Of course, as we enter purchases at the time the money is paid out, large purchases, as of plates, may not occur each month, but the very next time a similar entry is made we are able to note how long our plates have lasted and to strike a monthly average.

APRIL 1, Statement JONES MANTLE AND TILE Co.					
DATE		AMT.	date		AMT.
Mar.		1 50	Apr. 1		51 00
" 3		5 50			
" 7		12 00			
" 9		7 00			
" 13		4 50			
" 14		50			
" 21		7 00			
" 27		9 50			
" 31		3 50			
		51 00			57 00

Fig 5.

The commercial photographer who does a lot of work for manufacturers, rendering a monthly statement, will be interested in the card shown in Fig. 5, a summary of the various items recorded on his order cards. This card is clipped to the order cards as they accumulate during the month, the amount of each order and date (and order number if necessary) being entered upon it as the order card is made out. At the end of the month the manufacturer's statement is ready and only requires copying upon the required form. When the check in payment is received, the statement card with the orders clipped to it is removed to the completed order-file. If unpaid it stays in the live file until payment is made. If the business is large it may be removed to a separate

file of delinquents, in which it will remain until collected, or given up as hopeless and weeded out. By this system you always know who don't pay and know it quickly.

When all is said and done there are many advantages to a system of this sort. By keeping informed upon his daily growth, his waste, his seasonal volume of business, and so forth, the photographer is soon able to put his finger upon defects in his methods and to weed them out. Success is the reward of constant vigilance. To the outsider it sometimes looks like luck, but the man behind the works knows that results only follow careful and sensible planning, and the best plans are built upon definite knowledge of the ills which beset the business.

PHOTOGRAPHY'S CALL TO THE COLORS

THE call has gone forth. From every wall posters are calling upon our young men to enlist in the cause of liberty. Great full-page ads. in the papers invite us to spend our dollars for the liberty loan that the cause of free government may not be allowed to perish from the earth. These are times of stress, as war times always are. Our feelings have been aroused. A great cause which can unite a whole people of 100,000,000 souls appeals to something deep in our natures. We do not sacrifice life, friends, loved ones, and opportunity for causes that are not made of this stuff. We do not throw our lives away upon trivialities, and nothing short of a great spiritual upheaval, a great engrossing ideal, can lead us into paths that are strewn with gore and blood. It is a day of sacrifice, when everyone wants to do his part. The young and strong will enlist to expend their might and main in the actual conflict. But we who are left behind what shall we do? And what of photographers, whose work has not always seemed to be any too well valued in peace times? Are we now a mere superfluity?

Doubtless, many photographers have pondered this question. Many have felt that they were being pushed out of the scheme of things at a time when everyone wants to feel himself a useful factor in making the world go around. Has the time come now when we must be a burden, performing a useless part in the great drama? No! The answer is *No!* The photographer is as loyal and patriotic a citizen as any in the land. He is as ready to do his part on land and seas as any other citizen of the community, and if he is left behind he can and is going to make of his work something more than a mere vanity. Photography may be one of the tools for perpetuating beauty, but it is something more. It is the great and only unprejudiced historian, which can write indelibly into the pages of time the truth of passing events. Not many of us will be called to record the details of battle, the terrible scourge of death which must mark the winning of our cause, as photographer Brady had to do in the Civil War. Not many will have to risk life and limb to tell future generations the meaning of the word liberty in that way. But who will say photography

did not play a vital part in making permanent, by its chemical magic, this curious story to fire the imaginations of future generations with the truth that liberty rests upon such tragic sacrifice and that great ideals must be paid for.

Even as Brady, with his lens and wet plate, has arrested time and made the stirring events of '61 clear to us today, so may every photographer photograph the events in his individual town preparatory to this great conflict, but he may also preserve inviolate for mothers and families the pictures of those who have gone away, many of them never to return. Somehow it is easier to part with one if you have some permanent token which can forever refresh your memory of him. Let us feel that this is a great and worthy work we do which makes it easier for mothers to grant separation that the great protecting line may show no holes, no weaknesses. Let no photographer feel that this is a small duty, that it is not worthy of him, that is not worthy of advertisement. Every soldier owes it to those behind to visit the photographer before his departure for the front, for has he not a duty to those who have nurtured him from birth and tenderly cared for him in childhood, as well as to his country? Let the photographer feel honored that he may play such a vital part. Let him do all he can in the cause. If he cannot enlist, let him encourage the government's program with every means in his power, and there are many. Let him be not ashamed to advertise and to emphasize simply and without exaggeration the duty to visit the photographer. It is a duty and many will thank you for bringing it to their attention. Buy space in your local paper and start a little drive along the lines indicated below. These ads. have the martial spirit. Everything that turns the mind toward the great cause is helping it flourish, if it be in the right spirit. Do your part. By keeping your business alive and a necessity to the community you render a service and do not become a burden to it. There may be enough others made dependent, why should we be among them? It is vital to the coun-

try that business be not impaired. So up and get busy. Advertise. Do something to keep yourself, and to enable you to turn something over to the war exchequer.

[Boy's Portrait in Uniform.]

A photograph of your son now—before he goes to the front. How dear it will become when he is far away.

SMITH, *Photographer*,
211 Jones Street.

[Mother's Picture.]

What soldier would be without it. On the battlefields of France how precious it will be to you!

Take her to the studio today, brother, before you leave for the front.

SMITH, *Photographer*,
211 Jones Street.

[Family Group.]

While you are all together. Why not have that group picture made today, before he leaves for the front.

What wouldn't you give for that picture some day?

Go today. SMITH, *Photographer*,
211 Jones Street.

There are many ways to advertise now. At a time when the imagination is aroused, a more dramatic appeal than would be tolerable in peace times is allowable and even advisable. Martial window-trims are in order, and the photographer's window can be made really helpful to the cause.

Spread a few photographs of soldiers about for fill-in. If you can get pictures of prominent local citizens all the better, and be sure and put a card underneath their pictures telling who they are. The example offered by these prominent persons is certain to have an effect. Change your display often.

If you have a good portrait of the mayor, make a sepia enlargement from it and put this in a frame as a centerpiece and beneath it place a card bearing some martial statement he has made. You have probably read something in the paper he has said which will be appropriate to this purpose. If there has been a flag-raising or a departure of troops you have, of course, secured views of it and these will make interesting and helpful decorations for your

display. A good picture of soldiers gathered around the camp-fire, enlarged, will make an attractive *pièce de résistance* for a window, and if you have a turn for the dramatic you can arrange an imitation camp-fire in the window with electric lights and a fan. A stack of arms on the sidewalk would heighten the effect. At noon hour and at sunset a boy-scout would be glad to stand in your doorway and with trumpet sound the appropriate military calls, a ceremony which you may be sure would be talked about by everyone in town.

If you have a way of learning of the young men who have enlisted, an appropriate card congratulating them as good citizens, sent to them, and asking them to step in to have a negative made, would certainly not be lightly regarded by the family to which he belonged. And how precious those negatives will become. You could even afford to make post-card negatives gratis of soldiers in uniform, advertising the fact,

and granting one print, and giving them a card stating the negatives would be permanently filed in case in future prints were desired from them. They would not be forgotten.

In many such ways as this can a photographer make his work and presence in a community helpful in this dire hour and still profitable to him. It is a time when every man needs to stand on his own feet. It is a time when he must feel that his work has a purpose beyond a merely selfish gain. *Photographic portraiture now, more than ever before, fulfils a lofty mission.* It has been lifted out of the category of mere luxuries and become a necessity, of which we need not be ashamed in this day of famines, bread-lines and death. Photography has heard its call to the colors and is ready to do its part, on the firing-line, by financial sacrifice, by self-maintenance, and by making itself a need to those who must suffer.

SIMPLIFIED NIGHT PHOTOGRAPHY

By EDWARD R. TRABOLD

WE are in an age of progress. To-day it doesn't pay to lose your patrons, your temper, valuable time, and plates because of insufficient lighting. Don't be a failure because you fail to grasp the golden opportunities about you.

After using my first Cooper Hewitt light for some time I obtained such fine results that I was inspired to write to enlighten brother-photographers by my experience. During the course of one year one can save enough by these uniform results and sure exposures to pay for the light. Since writing the last article I have found an easier way to make fancy as well as plain lightings, so simple that the amateur and the professional will grasp the idea in as few minutes as it takes to read this.

The whole idea is concentrated in a small screen made, as illustrated, of

white cloth, with a dark curtain fastened to the bottom of the screen so arranged as to draw up.

If your studio is in a small town or in a large city you cannot afford to be without this light. We will take it for granted that you have a fine skylight—one that you consider good enough for any kind of work—but the point is that it is no good for night work. Because of business conditions the average man cannot come to your studio in the daytime, but I find that he will when you show him that you can do just as good work at night as in the daytime. You will also find that this light is essential for a great many wedding groups—for jobs that you are losing now because some of your patrons that are married in the evening are not aware you are equipped to make sittings at night. I will also say to those who have no



FIG. 1.—SCREEN, LIGHT AND REFLECTOR
ARRANGED FOR BROAD LIGHTING



FIG. 2.—SCREEN, LIGHT AND REFLECTOR AR-
RANGED FOR EDGE OR REMBRANDT EFFECT

skylight and are using some other means of lighting for their work, that they are wasting money and time on outfits that are more cumbersome, costlier, and harder to run than the Cooper Hewitt tube. For instance, around Christmas time you will be surprised at the number of sittings you can take in the evening that otherwise will go to your competitor who has plenty of time during the day. This light is a boon to any photographer during the rush season or in the dark winter days when the light is poor.

If you make an exposure of a certain lighting, *i. e.*, a linelight, etc., you can duplicate it over and over again without a failure, for all you have to do is to remember the time, plate, etc. This makes it dead sure, and the saving in plates and material will soon pay for your light. This light is a fine thing for soft effects and I have never found a lighting that cannot be made with it. I have used it on babies with a quick

bulb exposure which have, with few exceptions, been great successes.

The advantage is that you always have the light ready instantaneously. Simply turn the button, use it as long as necessary, and turn it off again; hence the expense is very little. The photographs that accompany this article are of local young ladies in my own town, and were made in the ordinary run of business and not made especially for this article. Give this light a fair trial, and note the difference in the number of your sittings and also the fine, uniform results. My motto is, "Once a Cooper Hewitt always one." The light these pictures were made with is a Cooper Hewitt, Type F tube, for alternating current circuits, auxiliary, reflector holder, tube and shifter, and 60 cycle light. It is hung on two pulleys from the skylight, so that it can be adjusted at will. A blueprint is sent with the light and you can hang and install it yourself, as it is not hard to



FIG. 3.—SCREEN, LIGHT AND REFLECTOR
ARRANGED FOR LINE LIGHTING



FIG. 4.—SCREEN, LIGHT AND REFLECTOR
ARRANGED FOR BACK LIGHTING

understand, and is shipped wired ready to attach. I have the auxiliary on the side of the wall out of sight, with two six-foot leads running from this to the light. Any electrician will hang it for a dollar if you don't care to do it yourself. I would advise in the use of plates—not fast ones, but good old stand-bys. The exposure, two to four seconds—allowance being made for the type of lighting you are making. With a faster plate these exposures can readily be cut in half. In fact the faster plates are recommended for work with children. The exposure can also be cut down by using a second fifty-inch tube. The photographs show the sitter, position, and lighting. In describing the lightings I have tried to make them clear and distinct without any frills.

Fig. 1 shows the light, screen and position of the sitter. The only changes needed for all lightings are, turning the sitter on the stool and moving the side-screen forward or back until the desired effect is secured. Note that the sitter is placed in front of the light, with the screen between the sitter

and the light. Now, if you pull the screen forward, the light falls on the back of the sitter's head. (Of course it is understood that the sitter is facing the camera squarely.) Then, leaving the screen and light as it is, have the sitter turn to the right a little at a time. The light will strike the side of the face first. Then if you stop here, with the head turned so as to make a three-quarter view of the face, with a white screen placed between the head of the sitter and the light, you will get a good edge lighting, although you can raise or lower the light to suit. After two or three attempts you will have it mastered. If you turn the sitter further into the light and move the camera to the left, leaving the screen as in Fig. 1, a good line lighting is secured. Keep the reflector in position as shown in Fig. 2, as you need a great deal of reflected light. You can substitute a mirror as reflector for obtaining some fine double light effects. The mirror should be fastened on a movable frame so that it can be swung in any direction. Now leave the head-screen and the side-



BY EDWARD R. TRABOLD
WALLINGFORD, CONN.

FANCY LIGHTING, CALLED REMBRANDT. LIGHT, ARRANGE SCREEN, ETC., AS FIGURE 2. EXPOSE ABOUT FOUR SECONDS. USE PLENTY OF REFLECTED LIGHT. THIS PHOTOGRAPH WAS MADE FROM LEFT SIDE BY TURNING SITTER AND CAMERA THE OPPOSITE WAY.



ARRANGE SCREEN, REFLECTOR, ETC., AS IN
FIG. 2

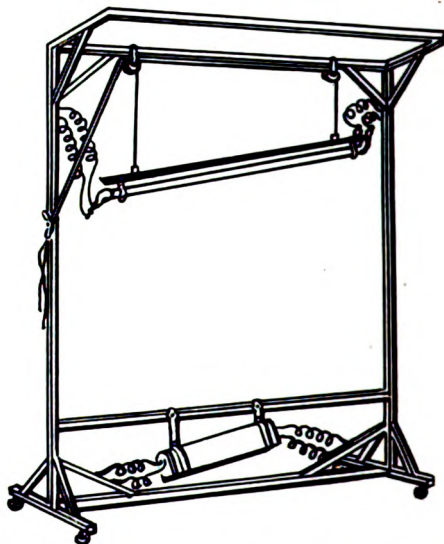
screen as they are and turn the sitter to the left, at the same time moving the camera to the right until you have a three-quarters view of the face. You will now have a back lighting. The light falling on the right side of the back of the head will leave the left side of the face in a soft shadow. Now turn the sitter a trifle toward the camera and move the screen back toward the background until the front edge is even with the sitter's face. This will give you a broad, plain lighting. You can adjust your reflector, etc., a trifle according to your own judgment. Some photographers use a dark head-screen but with the single tube I would not advise it. The reader will understand more clearly the manner of lighting and general position of the accessories.

Silhouettes are easily made with a Cooper Hewitt light, using the light and the screen as you would a window. One photographer I know has a home-made fireplace painted on a screen, in the back of which he lowers a tube, and with the aid of a mirror in the bottom of the fireplace, set at an angle of about forty-five degrees, will throw the light

onto the face of the sitter. Then with a small tube behind the sitter he lit up the deepest of shadows.

This article is too short to give more details than those already mentioned, but if anyone requires any further information I would be glad to give further details regarding arrangements, etc., by enclosing a stamp when writing to me.

If you have room in your studio I would recommend the following way to hang your light, as it increases the amount of light twofold and does away with the head-screen. It is easier to control and has the advantage of being



OUTFIT SHOWING ADJUSTABLE STAND AND
TUBES

able to be moved about the studio according to your wire leads (see above diagram). This framework is covered all over with thin white cloth which buttons onto the frame. In back of this is tacked black cloth, and also over the top. In this way the light is reflected forward and also downward. The auxiliary should be placed on the bottom of the frame to help balance the light.

You can surprise the folks in your town with fine work made at night, and can prove to the most sceptical that daylight is not essential for making good photographs.



BY EDWARD R. TRABOLD
WALLINGFORD, CONN.

ARRANGED AS FIG. 1, BRINGING REFLECTION
TO FRONT. EXPOSE FROM TWO TO THREE
SECONDS.



PRACTICAL PAPERS ON STUDIO WORK AND METHODS

Some Suggestions for Running a High-class Photographic Studio

As there are more ways than one of killing a cat, so there are more ways than one of running a studio. If "tabby" is your objective, you would hardly adopt the tactics usually associated with the pursuit of "stripes." If you propose to run a stamp and postcard outfit you would hardly go about it in the same way as though you were angling for the cream of society. Even the details of business, with which the general public has no concern, would differ, and differ very widely. In the very cheap trade, the careful numbering and storage of negatives, for instance, is so much waste of time, space, and energy. In business, you cannot afford to do what you are not paid to do, any more than you can afford to do what there is no object gained in doing.

The method of running a studio depends upon three conditions: What you can do; How you do it; and Whom you do it for.

The photographic studio is a trade or profession—is, in fact, what you can make it. The less of the personal element that predominates the more of a trade it becomes, and *vice versa*.

What, in short, is it that you want to do? Are you after the volume of trade, or high prices in particular? Will you cater to the masses, the vast and predominating demand for a reliable map of the human animal dressed as the dolls of social requirement? or, Are you striving to appeal to the nobler instincts, character, and refinements cultivated and fostered by the high exponents of a latter-day civilization? Given the ability, this question, or something like it, is the first that you will have to decide. And you will decide it by what you can read into the practice of it in the way of modification with reference to your own particular necessities and devotions.

As a recent writer on this subject has remarked, a magazine editor could hardly provide the necessary space for a man who was capable and

willing to exhaust the subject. It is therefore necessary to specialize, and I propose here to offer readers a few ideas—or, perhaps, it would be more honest to say—since I can claim no special originality for them—recapitulate a few ideas for running a studio on neither cheap nor even middle-class lines, but rather upon those which lead to the expression of the personal factor, and the comparatively high prices which that expression always commands.

Personality is the most elusive thing in the world, but whatever it is, and whatever it means, that is, how it reacts upon our fellow-mortals, and to what end, these considerations at any rate may be differentiated for the purposes of this note. We can say, for instance, that the man who attracts us, with whom we feel personally at ease, whom we respect before we know (whether we respect him afterward or not), who can make us forget ourselves in the interest of his society—that man has personality. I mention these points only in illustration of that phase of personality which lies on the surface, that, like the sparkle of some precious metal in a chunk of dross, attracts and interests from the outset; and, for a client, the moment he enters your studio, to feel interested and attracted by the personality of the photographer is half the battle of the business.

And yet this man may be a cold enough fish when you come to know him better. That points to the fact that personality on the surface only serves one purpose—if a very valuable one; that other, and perhaps "better part," reveals itself only gradually through prolonged intercourse and better acquaintance. Interest must be sustained beyond the reception-room, beyond the skylight, and beyond the threshold of your business. It must invade the innermost *sancta sanctorum* of clients themselves: its influence must be felt there, where the surface sparkles cannot reach to illuminate.

To be poor in either of these qualities, gifts of personality, is to be the worse for it; in the first case, interest will be inspired but not sustained; in the latter, the interest can only

operate after the tools of enforced social intercourse have mined and brought it to light.

This, I feel, is the flimsiest statement of fact, and I have only remarked on it since it is an absolute *sine qua non* in every class of service which aspires to the dignity of a profession. Doctors, lawyers, politicians, pastors, artists—all and every one of these know full well that humanity bows before the fetish of personality, be it good or bad. And all photographers at the top of the tree, and many who are still climbing, know it full well also.

The next asset of the photographer, whatever his personality, I put down as Tact. Tact may or may not be a feature of your strong-personality man; but, if it is not, he will suffer grievously in his business relations with clients.

It has been said, and very truly, that the money of a photographic business is made in the reception-room; consequently, if you are wanting in tact and resource, if you are naturally impatient and have difficulty in concealing annoyance, leave the business-end of your establishment in the hands of one perhaps not so gifted as yourself, but who has just that modicum of tact and good manners which in many businesses, and it may be in yours, is worth all the personality of a dozen others like you rolled into one.

The artistic temperament is all very well—it is fine, delicate, discriminating; but it has all the defects of its good qualities. Conceded that you can deliver the goods, it does not follow that you can take the orders for them. If you can, all the better for yourself, at a pinch; but it is just as well, in running a high-class establishment, or any sort for that matter, to keep out of the market department. Exceptions will occur to everyone but, on the whole, more dignity is lent to the profession by the absence of barter with the principal. Leave that to your high-priced receptionist. Get away from the money-end. It will cost you cash; but a first-class receptionist is worth her weight in gold anyway. The money-end of the business is a necessary evil, but that is no reason why you should mix yourself up personally with it. If you can avoid it, do so by all means.

After all, your reputation must count for something. People come to you—the heaven-born artist—knowing that you can and will do them justice. They come to you for pictures; take them, and without unnecessary delay. Prices and styles with proofs. That is the ideal way. The discussion of prices with such as I have in mind is the fly in the ointment; for, remember, the best class of client, to whom perhaps you are no whit inferior intellectually, is in its way just as touchy as yourself. A dollar more or less to these people is nothing provided they get what they want. Of course, even the best studios are not visited by exactly the same class of people throughout. That being so, how much better to leave all classes in the hands of your receptionist! Rather than talk prices, let her prove and exhibit to clients the value and virtues of your work. Satisfied with this, the last qualm is dissipated, and they enter the dressing-room fully aware of the satisfaction they will receive at your hands.

But there will enter those—strange to the special working of your establishment—who will demand prices and styles before they sit; and there will be times when the proprietor will be quite unable to avoid them without rudeness. In that case, he must do the best he can. Under these circumstances, he would be well advised to have a little conversation ready. Having replied to a number of questions in terms of cash, he may find his opportunity in such wise:

" . . . but I really dislike discussing prices, especially at this stage. It seems to rob me of my chief pleasure in taking pictures." Thus the personal note is introduced, and, noting the effect of this little speech, he may then confidently continue:

"You know, what appeals to me is that my clients should feel satisfied from my pictures that I can do them justice. If that should be so in your case, this is what I propose to do. You have told me what you would like," or "I have seen which are the styles you most favor, but I would suggest that I take several different positions in several different sizes. That is my usual custom. It really is more satisfactory than sitting for one particular style and size, as it gives you a choice you would not otherwise have. It also affords me an opportunity of showing what I can do in your case, and it will cost you nothing but a little extra time. Indeed, I would go so far as to say that, if you have not ample time at your disposal now, I would suggest you make an appointment for some other day when you would be more at leisure. Nearly all my work is by appointment; but my convenience in this matter shall be yours. Then when we have the proofs you can decide which shall be finished off. After all, we can do nothing without the negatives, and you can have them completed in any style and at any price which you may then decide upon. What do you think? Shall we try several positions, including, of course, some of those you fancy?" And you will find that in nine cases out of ten the personal bait will be swallowed—as, indeed, it should be. It sounds good to most people, in my experience; it proves workable, and the principles are sound.

"And if none of the pictures suit, how do you arrange?"

"Well, you can sit for your pictures as often as you like. No charge is made for this. That is the only way I can guarantee my work; and by that means I am sure that none but satisfactory pictures leave this gallery. But I very rarely have any re-sits, owing to the number of positions I take in the first instance. Re-sits are troublesome to clients; but those who desire to re-sit are welcome as often as they care to visit me for that purpose."

This is straight talk. It is more. It is straight dealing. It is more. It serves to emphasize the personal equation for which people will pay.

Some Maxims in Reception-room Arrangements

And the third requisite is Taste.

As soon as a client enters your premises, she should find that about her which will move to admiration, or, at least, not incite to antago-

nism. Everything should be orderly, clean, and in good style—the style of the proprietor—for “style is the man.”

If you care to make it so, the reception-room can be “homely,” furnished and upholstered much as you might choose for a living-room, not sacrificing anything, of course, in the way of viewing convenience. The lighting of the pictures should be good, just enough and not too much. It is hardly realized, or, at least, it is rarely practiced among the fraternity, or even by exhibition committees, that photographs are best seen by reflected light. This is fairly common to find in the case of, say, big-framed portraits; but the principle applies just as much to small work, and given the taste and desire, it should not be impossible so to arrange practically all pictures on show in such a way that they are never seen in direct artificial light. If daylight, it must at least be soft and diffused.

And do not crowd your wall with pictures. Let them be of the best, and appropriately spaced. The best pictures, if crowded, will appear inconsequent. Give them room. Photographs, more than any other class of pictures, want plenty of room owing to their comparative lowness of tone.

And the furniture, too, should be roomy, comforting to see, comfortable to use, not too much of it, not too shiny—shining, that is, with the shine of new varnish. High-power varnish is an abomination anyway. Avoid especially the massing of heavy curtains with meaningless cords and tassels that tie nothing and collect dust. They have their uses—monumental, theatrical—at times, in places; but you do not want them about you always. Too often are they heavy and lugubrious or garish and tawdry of effect.

If good taste is to be a consideration, inasmuch as it is now under consideration, be chary of the gilt on your frames. If you framed every picture on its own merits, you would find very little use for gold at all. The rule is never to put a gold line round a picture when any other color would serve its purpose as well. And that purpose? Why, to set the picture off to best advantage, to be sure. Gold nearly always attracts, and therefore, distracts the eye. In fact, even the lack of gold distracts—although that, perhaps, is due to other causes. For decoration, it should be used very sparingly, or in great preponderance, for in its very preponderance the eye will be the more apt to lose sight of it. Any intermediate proportion is fatal in the framing of a photograph.

When to Talk About Prices

And the less obviously a show-room is a show-room, the better sort of show-room it will be—the more restful, the less distracting. Relegate to an ante-room, if possible, all evidences of business—desks, ledgers, pigeon-holes, and the like. Keep the cash department in the back-ground, as you may find it, as I have found it, more satisfactory to keep the actual discussion of prices until the time you can discuss such matters with the proofs before you. The mere viewing of the proofs tends to distract clients'

thoughts from the cash consideration. This does not necessarily mean that you take no deposit, although, in the case of guarantee work and no charge for re-sits, deposits are apt to lose their extrinsic value. It might be your business rule that every client pays a fixed sum before sitting—say, \$5—what you will, that is your affair. But with the class of client I have in mind you will probably find you can do without even this business method. If so, all the better. At the least, you can use your discretion. And this is easily done; since your receptionist, in the course of her duties, may mention casually that the same nominal deposit is required of everyone as a matter of form. The best time to arrive at the actual price of the order is with proofs before one. You stand a much better chance then of getting your full price without rebate, and you can, at the same time, best prove your reasons, if required to do so, for charging such a price.

And How to Justify Prices

Every picture, you can then explain, is treated on its own merits. Thus, to say that your mounts are designed by yourself and executed under your direct personal supervision on the premises, and not in California, or Montreal, or New York, means that they are exclusive. You do not buy ten thousand cards and retail them with pictures attached. You do things differently. Having made the pictures, you proceed to build the mounts to suit them. This means that you provide a more tasteful picture, regardless of price, than your clients are likely to get elsewhere. This line of talk presents a direct appeal to the client's taste for quality, exclusiveness, and personal attention, which, in most cases, will obliterate any desire to cut price, a thing which you must never do under any circumstances, unless you can see exactly where is the actual tangible return for such concession.

Explain that, under your system, no one style is better than any other. A client may show a preference—that is a matter of taste; you may yourself have a preference—that, again, is a matter of taste; and one style must be worth more than another for reasons which must be apparent. The materials are more expensive, the work is more specialized, the time it takes to complete it, longer, and so on.

Is this business? I believe it to be business of the best sort, since such methods tend to carry the interest of the transaction into the homes of clients, while at the same time it lifts the whole matter above the level of an ordinary business deal.

But this is not to say that, given the clientèle, a business run on such lines is any better than a comparatively middle-class trade, except in so far as the best is better than inferior taste, and that it is better to do that which you like doing rather than that for which you may have no special desire, possibly even a special dislike.

The Final Aim—To Make Each Sitter Advertise You

The subject is but scratched anyway; from beginning to end the photographer must realize

he must cater to his clientèle. What people want, that they will have. When a client says she does not like her pictures, she is always right; but when she begins giving her reasons for her dislike, in seven cases in ten she is wrong. This only goes to prove that people generally know a good thing, but do not always recognize a bad thing when they see it. A few good reasons and short tactful explanations thrown in, as a matter of course, will put most of them right. Why bother? Because if you don't or can't put them right, someone is sure to trot along some day and do the work you left undone, and that is not usually such a long day off, and it won't be done half so considerably, either.

It is a law, or a foible, whichever you will, of human nature to treat oneself a shade better than you can expect to be treated. Therefore, I say, deal considerably, sympathetically, intelligently, courteously, and not too mercenarily with your sitter "whiles you are in the way with him," for only by so doing can a photographer ever expect to retain his client's interest in his favor; encourage him to sing his praises as an artist and an honest man, and return to him for pictures—the liveliest test of his opinion of him, that!—with the persistence of a recurring decimal.

And if this is not good advertising, I don't know what is, that's a fact.—L. HAWES, in *British Journal of Photography*.

Good Enough

IF we make a critical examination of most photographer's showcases or windows we shall be forced to the conclusion that although the artistic sense has of late years been successfully developed, the general level of technical excellence has shown a tendency to a retrograde direction. Modern conditions have doubtless something to answer for in producing this result, the very facilities for obtaining negatives and prints tending to a toleration of inferior work. When wet collodion was in use for portraiture all negatives had to be developed on the moment, and in the event of a poor result another plate was at once exposed and the error rectified. Now the faulty negative has to be worked up until it will pass muster, and very often is handed to the printer with a lingering feeling that after all it would be best to throw it under the sink instead of trying to print it. Our modern printing processes are, unfortunately, too kind to bad negatives, and it is a bold man who will say nowadays that a negative is too bad to print. With albumenized paper one had to use a decent negative in order to get a good tone, for the old-style glossy prints were either good or bad, and what many men now regard as quite a passable result would have taken its place in the latter class, and been consigned to the wastebasket instead of being sent to the customer, or, worse still, used as a specimen. The great bulk of the ordinary photographer's patrons like brilliant, well-defined pictures. They may assume a liking for a foggy sepia print mounted on a piece of brown paper because they must be in the fashion, but in the majority of cases they would

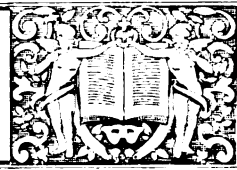
be much better pleased with a picture perfect in technic, mounted in a way to do justice to its quality. It is a matter which can be easily put to the test by showing samples in both styles, and listening to, and profiting by, the comments made upon them. Developing papers have much to answer for in the production of mediocre photographs, their very excellence and convenience of manipulation leading to carelessness in working and the passing of inferior proofs. It is, we believe, generally accepted that although there is a wide limit in exposure there is only one correct time which permits of the image being fully developed and thereby producing the true values of the negative, but how many people trouble to ascertain this exposure, and perhaps waste a little paper in doing so? Very few, we fear. The average printer now gives a full exposure so that he can make sure of some sort of print every time, and does not worry much about gradation or color so long as the prints are fairly clean. We would recommend any photographer on taking up a new paper to let the manufacturer make him a few prints from some of his ordinary negatives and to set these up as a standard for the guidance of his printer or himself. We all know the story of the printer who said, in answer to a complaint, that he was making the best of the negatives given to him, whereupon his employer sent some out to be printed at a rival establishment. These were much better, but the climax came when our printer said that he could beat them out of sight, and he did so.

We remember many years ago an aspiring young photographer who used to purchase any published photograph which he thought to be of unusual excellence, and to strive to produce one which would bear comparison with it. Sometimes he thought that he had succeeded, but after a few days he would see where there were shortcomings in his own work, and then came another attempt. This practice soon made his technic as good as that of his unconscious mentors, and his work became in its turn worthy of imitation. There is a vast difference between the soldier who practises steadily at the target and one whose shooting is represented by a *feu de joie*, and we have both these types in photographers—the one who has attained perfection by study and labor, and the hit-or-miss worker who depends on his natural ability. Brilliant he may be in his ideals, but what of that if he cannot realize them, if the fine effect in lighting is lost by incorrect exposure and still further injured by unskilful printing?

What we want our readers to do is to overhaul their current specimens and to ask themselves, Can better prints be made from these negatives? If they can, then in common justice to yourselves make them, or get someone else to do it. Do not think that the public will not appreciate the difference. The ordinary man or woman may know little about photography, but they are much quicker in recognizing good work than most photographers credit them with being. They will accept poor prints if they cannot get good ones, but if good ones are to be had the man who makes them will get the trade.—*British Journal of Photography*.



VIEWS AND REVIEWS



News Photographers Organize

At the suggestion of the Committee on Public Information, the principal news photographers have formed an organization that will deal as an authorized body with the committee at Washington. A meeting of the representatives of the leading illustrative news bureaus and syndicates of the country was recently called in New York by Kendall Banning, director of the division of pictures. Plans were made for cooperative action between the news photographers and the Committee on Public Information for handling both official and unofficial photographs during the war on a basis that will provide equitable opportunities and privileges for the large and small syndicates, photographers, and dealers alike. It is considered probable that the organization created on that occasion will be extended into a national association of news photographers, and that it will be maintained as a permanent body to represent the trade as a whole.

The photographers elected a Board of Representatives, which was given authority to represent the photographic interests in their relation with the committee in Washington. The board is composed of G. W. Bonte, *New York Herald* Syndicate, chairman; C. R. Abbott, of Underwood & Underwood, Secretary; Thomas F. Clark, of the American Press Association; Albert K. Dawson, of Brown & Dawson; George G. Bain, of the Bain News Service; D. Z. Murphy, of Central News Company; E. B. Hatrick, of the International Film Service; George Kadel, of Kadel & Herbert; George J. Wilkinson, of Paul Thompson and Harris & Ewing; H. W. Sierich, of Press Illustrating Co.

Representation in this body is open to all news photographers throughout the country.

Photographers' Association of America. Official Notice

AFTER careful consideration and looking to the best interests of the Association, the Annual Convention of the Photographers' Association of America, scheduled for Milwaukee, Wis., week of September 3-8, has been abandoned by the Executive Board.

The American Congress of Photography will meet on Friday and Saturday, August 3-4, at Cedar Point, Ohio, immediately following the Ohio-Michigan-Indiana Convention. This Congress will outline the work to be taken up by the Photographers' Association of America for the coming year.

RYLAND W. PHILLIPS,
President of Photographers' Association
of America.

June 28, 1917.

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New Ansco Catalogue

THE Ansco 1917 Amateur Catalogue has been received—"Anscoring America" is the title given to the book, and a series of thumbnail sketches depict the Ansco camera in use at many points of historic and scenic interest in our country.

The book consists of 64 pages and was printed in two colors by Rogers & Company, Inc., of New York City.

Fifty-eight different camera offerings are listed and described. Special attention is called to the incomparable line of miniature cameras, comprising the Ansco Vest Pocket series for pictures $1\frac{1}{4} \times 2\frac{1}{4}$ and $2\frac{1}{4} \times 3\frac{1}{4}$ inches. The higher priced models are equipped with several choices of anastigmat lenses, and these models all have a simple and convenient focussing device which is an essential feature for the finest anastigmat work.

New tables showing the depth of focus, lens speeds, and lens markings of the different lenses on Ansco cameras furnish valuable information to the amateur.

Complete price lists of Ansco Speedex film and film packs, Cyko paper, Ansco and Cyko chemicals and Hammer dry plates are published in addition to the camera descriptions. Amateurs will find the book not only interesting but instructive, and everyone is urged to write Ansco Company, Binghamton, N. Y., for a copy.

Employees of Sprague-Hathaway Celebrate

THE employees of the Sprague-Hathaway Co., of Somerville, Mass., the well-known picture house, recently held a celebration in their new building and on the occasion presented the firm with a handsome American flag. President Wallis of the company, in accepting the flag, made mention of the fact that the first American flag, which was made January 1, 1776, was unfurled in the neighboring city of Cambridge at Washington's headquarters.

"National News in Pictures"

THIS is the title of a well-printed and attractive publication, advocating the advantages of the Harris-Ewing News Service of Washington, D. C. The foreword tells the object.

"To present the story of our national life, written in pictures that are the best newspaper copy it is possible to produce—this is the object of the Harris-Ewing Photographic News Service. To accomplish that end it has a staff of trained newsmen who cover the field with camera and caption as any city editor gathers his local news. It offers the result in a regular service to newspapers. Millions of people throughout the nation today know at a glance the faces of people in the

public eye, introduced to them by Harris & Ewing, through the years of that firm's existence as the premier distributor of news pictures from the nation's capital."

Here is another excellent example of the enterprise and business energy of George W. Harris.

The Art of Looking at Pictures—An Introduction to the Old Masters.

By CARL H. P. THURSTON

MOST books on painting are written for people who are already familiar with the subject. *The Art of Looking at Pictures*, however, is a primer. The methods of approach which it offers were worked out in the course of the author's own struggles to see something more than crudeness and ugliness in the Old Masters, while he was still keenly aware of all the obstacles in the path. It points out only the things that *anyone* can see with a little practice; but these things, and the methods of looking for them, have been so chosen that the reader soon begins to enjoy these "dull" pictures in spite of himself.

It is essentially a practical book, arranged to be applied, line by line, to the pictures themselves or to a collection of photographs. The names of the one hundred and twenty artists treated are arranged in alphabetical order, and the "Directions for Looking" are applicable to *any* picture by that artist, telling not merely *what* to look for, but *where* to look, and *how*. The book also contains much valuable introductory material, a bibliography, an index, and an important chronological chart. With 32 illustrations. 12mo, semi-flexible cloth binding, \$1.50 net. Dodd, Mead & Co., New York, or through this office.

The Gross Photo Supply Company

THE Gross Photo Supply Company, of Toledo, Ohio, are manufacturers of uncommon photographic mountings, and sell only direct to the professional photographer. Their designs are original and different, their service is excellent, and their prices are surprisingly reasonable. They are known as "The House that Ships Promptly" Get in touch with them!

Rexo Book for 1917

WE take pleasure in bringing to the attention of our readers the 1917 edition of the *Rexo Book*.

This is a complete catalogue of the Rexo Photo Products, manufactured by the well-known house of Burke & James, Inc., Chicago. This book will be of value and interest to every camera-user, and a copy will be mailed on request.

A Call for Photographers

AMERICAN citizens highly qualified in photography (including experimental work) may be enrolled as Chief Petty Officers or Petty Officers of the First Class in the Naval Reserve Flying Corps by applying to the Reserve Office, 26 Cortlandt Street, New York, from 9 to 5 o'clock. This branch of the service offers to the patriot opportunity to perform invaluable service to his country. Men of spirit qualified in this work should have their names on the roll of honor.

Announcement

IT is announced that the Philadelphia office of the Cooper Hewitt Electric Company, manufacturers of mercury vapor lamps, has been moved from 124 South Eighth Street to the Drexel Building.

Surfacing the Enlarging Easel

AN excellent covering for the surface of the enlarging easel is the soft linoleum, or "cork lino," sold extensively for floor coverings. It should be glued down all over the board, so that it may lie quite smoothly, and we then have the luxury of a cork-faced easel into which the feeblest pin can be driven with ease, while the hole vanishes when the pin is withdrawn.—*The British Journal of Photography*.

Pictorial Photographers of America Traveling Exhibition 1917-1918

WE have received the following announcement from the Pictorial Photographers of America:

The Pictorial Photographers of America have succeeded in perfecting arrangements with the following art museums for the holding of exhibitions of pictorial photography from September to March, 1918: The Institute of Arts, Minneapolis; Milwaukee Art Society; Chicago Institute; City Art Museum of St Louis; Toledo Museum of Art; Detroit Museum of Art; Cleveland Art Museum.

The collection will also serve as a traveling exhibition to other museums with whom this society is now negotiating. It is intended that this exhibition comprise not only the work of members of the association but that of all prominent photographers in America. We, therefore, cordially invite your cooperation and ask that you send to us not later than August 1, not more than ten of your selected prints, priced and titled.

We intend to have all prints uniformly framed for their protection and also that a degree of harmony may prevail throughout the collection. After our selection has been made we shall ask you to send us \$1.00 for each print chosen for exhibition, this sum being necessary to defray the cost of framing. At the termination of the exhibition the framed prints will be returned to you, properly packed.

Please give immediate reply to this letter and return as soon as possible the enclosed leaflets, properly filled out. Write plainly all information on the back of your mounts, but do not paste on the leaflets. This we shall do after the prints have been framed. Mail prints in as small package as possible; they travel with greater safety in this way, and besides, we may have to remount so as to preserve uniformity. Mail your package to Pictorial Photographers of America, 707 Fifth Avenue, New York, and the earlier you send them the better will it facilitate the work of getting the collection in good order for presentation. Don't wait until the last day before sending it. If your prints are available, please forward them now.

Yours very truly,

PICTORIAL PHOTOGRAPHERS OF AMERICA.



CORRESPONDENCE

Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names & addresses of the writers are given. We do not undertake responsibility for the opinions expressed by our correspondents.



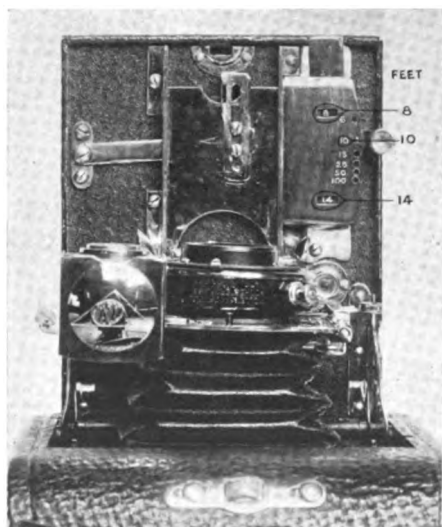
WORTH-WHILE LETTERS ON LIVE IDEAS

New Device for Depth of Focus Scale

TO THE EDITOR:

SIR: I notice in your valuable Journal that you describe and illustrate new devices pertaining to improvements in cameras.

I have a device (and a patent has been allowed) on a lever focussing scale which indicates at a glance the "depth of field" when set at each point of the scale for critical focus. I enclose herewith sketch, also two photographs; No. 1 shows the index lever (which is connected with the camera front) set with the pointer locked at 10 feet. This is the point of critical focus, and if for the photograph to be obtained you estimate the distance at 10 feet you set the lever as usual at this point. When you do this, *there automatically appears at the two windows of the plate*, numbers indicating the "depth of field," or, in other words, the range within which objects will be satisfactory sharply defined.



To illustrate: Photograph No. 1 being set at 10 feet the figure 8 (feet) appears at the upper window and the figure 14 (feet) at the lower window, showing that we have a "depth of field" in which the objects will be satisfactorily sharp of between 8 and 14 feet.

Photograph No. 2 has the indicator set at 100 feet, and in this case 26 feet will be shown at the upper window, indicating that objects will be in (346)

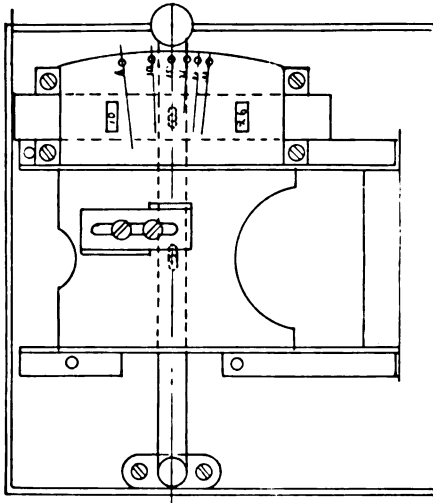
satisfactory focus as near as 26 feet, and at the lower window the letters *INF* indicating that all objects beyond 100 feet will be in focus.



This scale, of course, should be put on by the camera manufacturer and the readings should correspond with the focal length of lens used, and the scale is intended to be graduated for the full opening of the lens. The reason I did not design the scale and cover for the other openings of the lens is because, with the full opening of the lens, you have the least depth of field, and stopping down, of course, improves or increases the depth of the field, so that if you work with a scale showing the depth obtained with the full opening of the lens, with any stop that may be used, you are safely within the limits shown.

Upon the particular camera which is fitted with this focussing device the length of the lens is 5 inches focus and the scale was laid out for a stop of f/8. The complete scale reading is as follows: When the lens is focussed at 6 feet the depth of field shown at the two windows is from 5 to 7 feet. At 10 feet it is 8 to 14 feet; at 15 feet it is 10 to 26 feet; at 25 feet it is 14 to 88 feet; at 50 feet it is 20 to *INF*; at 100 feet it is 26 to *INF*.

I have thought of attaching a similar scale to a Graflex camera because it is very desirable, even with the Graflex, where you focus on the



DEPTH OF FOCUS SCALE

ground glass, to be able to look at the scale and see the depth of the field especially when we focus on "near objects." A scale of this character attached to a Graflex, of course, would have but two readings—that is, one window or opening showing the distance to the near objects in focus and the other opening showing the distant object. For the Graflex, of course, we would not show intermediate point of focus, because that would be shown on the ground glass.

The big advantage in my depth of field scale is the fact that all other "depths of field" are obscured except the numbers applying to the object upon which you sharply focus, and the scale is quickly read because you see only two figures and you do not have to take the time to make a selection as you would with an open scale showing all readings for different points of critical focus.

HARRY L. IDE.

JUNE 5, 1917.

A Universal Dark-room Developer

TO THE EDITOR:

SIR: Many things have been written concerning tanks and tank-developers relative to temperature, time, strength, etc., but I cannot recall of reading of an account giving a pyro stock formula with instructions for the proper amount of dilution for the different methods of development. For that reason I believe many readers will be interested in a formula that will adapt itself to be used in either the tray or tank method without modification aside of the proper amount of dilution, etc. After numerous tests I have succeeded in formulating a system that I have put to practical use for nearly two years past with complete satisfaction.

If the following stock solutions are compounded and used in accordance with instructions, satisfactory results are sure to follow:

A		
Water	24 oz.	
Sulphite soda (anhydrous)	4 oz.	
Pyro	1 oz.	

B		
Water	30 oz.	
Carbonate soda (anhydrous)	4 oz.	
(or crystals, 8 ounces.)		

C		
Water	16 oz.	
Iodide potassium	30 gr.	

For tray development take A, 1 ounce; B, 1 ounce; water, 6 ounces, omitting the iodide solution entirely.

For tank development, use as follows: A, 1½ ounces; B, 1½ ounces; C, 1 ounce; water, 30 ounces, or in these proportions according to the amount of solution required to fill the tank in use. Ascertain the temperature just before adding the stock solutions, that is, test the water, as the stock solutions will not affect the temperature perceptibly. Temperature should test 65° and being careful that the duration of development is carried on exactly twenty minutes. This procedure will give satisfactory results on most of the standard makes of plates, having tested it on Cramer, Standard, Polychrome, Hammer plates, with uniformly fine results. Should it fail to give the exact density wanted on other makes of plates, a change in the time of development of, say, two minutes more or two minutes less will doubtless bring about the desired change in strength.

To some it may be a speculation as to what action the iodide of potassium would have upon the developer when used in the tank. In this connection I will state that a very weak developer often produces a slight stain or fog which would result detrimentally to the printing quality of the negative and this solution is an absolute specific against this trouble.

The iodide solution can be added to any other pyro tank developer that may be used in about the same proportions as herein given with the same assurance of being a complete stain eradicator.

Of course it must be understood that all rules governing tank development not herein mentioned must be regarded, such as changing the position of the tank occasionally and other rules of this nature, if the best results are to be secured.

J. H. BURKHOLDER.

A STANDARD pyro-soda developer for normal exposures is pyro, 2 grains; sulphite of soda, 12 grains; carbonate of soda, 14 grains; bromide of potash, ½ grain; water, 1 ounce.

For overexposure, increase the quantity of developing agent, *e.g.*, pyro, metol, etc., add extra bromide up to 2 grains and use less alkali.

In making up pyro developers, the preservative (sulphite of soda or an acid) should be first dissolved in the water and the pyro added last.

With all subjects that contain harsh contrasts or err on the side of under-exposure, the developers should be diluted with twice its bulk of water.



THE WORKROOM

By the Head Operator

PRACTICAL POINTS ON BACKGROUNDS

SOMETHING NOVEL

ILLUMINATING IN GENERAL

NEGATIVE VARNISHES AND A SUBSTITUTE

HOW TO DO IT

F. NUMBERS

PHOTOGRAPHIC PRODUCTION OF A LITHOGRAPHIC
KEY ON ZINC AND ALUMINUM

PHOTOGRAPHING ANIMALS

EXTEMPORIZED BACKGROUNDS

SHADOW SIDE OF THE FACE

DEVELOPING GASLIGHT PRINTS

A FEW RULES I HAVE FOUND GOOD TO FOLLOW

TINTING TRANSPARENCIES

DEVELOPING LARGE PLATES

RULES FOR SUCCESS

EXPOSURE AND SIZE OF PLATE IN WIDE-ANGLE
PHOTOGRAPHS

USE OF A MIRROR IN PORTRAITURE

HINTS ON PHOTOGRAPHING AUTOMOBILES

INCONGRUOUS BACKGROUND

IMITATION OF ARTISTIC METHODS

COPYING AND ENLARGING IN ONE OPERATION WITH
A BOX CAMERA

A HINT ON PHOTOGRAPHING MACHINERY

SPOTS AND MARKINGS ON NEGATIVES

SILVER AND ITS RECOVERY

METRONOME IN THE DARK ROOM

Practical Points on Backgrounds

THE study of backgrounds is one to which every assistant should pay special attention, for nothing is so sure a sign of second-rate work as a badly-chosen background. All first-class photographers select the background with great care, bringing all their judgment and artistic knowledge into play. In many cases photographers have made a reputation and a big business on the use and manipulation of artistic backgrounds. To reach the front rank in professional photography it is needful to become expert in fitting these accessories into their proper position with respect to the sitter and the style of the picture. To take one background to be as good as another so long as it is not cracked or the paint rubbed off is an entire mistake. As with clouds in a view, only one ground will be most suitable for a particular composition. The choice and selection of backgrounds is a fine art, depending on the personal ability of the photographer for its success, and therefore it is no easy matter to teach it to others. All that can be done is to lay down several broad principles, which must be modified to suit special cases. These principles I will try to expound.

The subject and background must always be in unity. A naked savage in the midst of his natural surroundings does not strike us with a feeling of unfitness. Put a top hat on his head and the composition jars at once. Such mistakes in artistic sentiment are seen in photographs—a lady in evening dress being placed by the sad sea waves or upon the wild and lonely moor; a cyclist in a country lane standing upon a carpet, and a man in evening dress in the midst of woods, with a curtain suspended from the clouds, are a few examples of a lack of unity in sentiment. Such compositions are not so common as they were, I am glad to say, and we rarely see stone balconies built on carpets, grass flourishing on the seashore, trees growing

in drawing-rooms, and boats sailing on the mountain-side as we did at one time. These crude compositions have disappeared with the growth of culture among photographers. They are often very funny, it being a mystery how any one could have let them pass. It is not easy to avoid them in studio practice without the knowledge that these mixed compositions are in bad taste.

The sitter and background must harmonize. It is wrong to have the one simple and the other complex. For instance, we all know the elaborate backgrounds which some photographers employ with their sitters. Pose a child in a plain muslin dress against them, and the effect is at once discordant; yet with the richly-dressed society lady they harmonize well. The simply dressed need a background as simple; the more complex the personal adornments the more ornamental must be the background.

A composition must have a fine balance between sitter and background. It must not be all sitter and no background, nor all background, and, puzzle, "Find the sitter." The exact proportion to maintain is hard to lay down by rule; it is just one of those things which only a trained judgment can decide while the picture is being composed. Very few photographs are well balanced, the cabinet head, as a rule, being wanting in background, the three-quarter-lengths having too much. The three-quarter-length sitting is more often well balanced.

Objects depicted in the background must be in true proportion with the sitter. Failure to meet this condition is common to the majority of photographic scenic backgrounds. Place the sitter where you may, the perspective is always false, and instead of true proportion the effect is unnatural. I do not suppose that this can ever be remedied completely. With the painted background all that can be done is to avoid having vases that appear as big as houses, roads that are mere sheep-walks, and castles that must be too small for dolls to live in. The same applies to backgrounds which contain no definite

outline; it is not always possible to place them in such a position that the effect produced is a real one. Nine times out of ten it is obvious that there is a background behind the sitter. What is desired is that the background, instead of being distinct from the sitter, should be a part of the whole composition. This is best seen when the proportion is accurate.

Unity, harmony, balance, and proportion are often secured by contrast. Thus the strongly lighted side of a sitter may be placed against the dark side of the background and the dark side against the light—a double contrast which gives a better composition than if the position was reversed. The same is true of the subject in white posed against a dark ground. When the composition is mainly white, then a small proportion of the black gives a contrast which restores the harmony and the balance. There is a given proportion between light and shadow in every composition from which it takes a characteristic appearance. The Rembrandt is mainly shadow, strong and vigorous in effect. As the proportion of light is increased, so the picture becomes more delicate; hence ladies and children should be photographed so that the light predominates, while men will bear a much larger share of shadow.

Our leading professionals are giving up the scenic background because they have found out that the so-called "plain" background is, in reality, an accessory admitting of endless variations. There is no such thing as an evenly illuminated surface in a photographic studio, every area being more or less shaded. The plain background may be lighted in numberless ways, all of which can be used in portraiture. To show the possibilities of a plain background, I will mention a few. Backgrounds can be lighted

- From the top downward.
- From the bottom upward.
- From the left side.
- From the right side.
- From the center outward.
- From the sides to center.
- From the corners to center.
- From the top to bottom corner.

Here are several different ways of lighting a plain background, each one of which can be utilized to make an effective picture. These may also be combined to form other variations; hence, skilfully used, the plain background really consists of an infinite number of grounds. This is no theory, but a practical fact, which can be easily proved by comparing the backgrounds of our painters and photographers. No two are exactly the same, and until one has made the comparison it would hardly be believed how great is the variation and the possible number of combinations. Add to this the power of increasing and diminishing the illumination of a plain background, and it may be understood that our best photographers can get all the effects they want without the aid of the scenic background.

Something Novel

THE process which I am going to describe is not entirely original, as it has been occasionally employed by photographers heretofore, but, on

the other hand, it will appeal to many readers because it is practically a novelty as far as many readers are concerned.

The process consists of getting a photographic image against a ground of gold or silver. To secure this the simplest way is to make a thin, strong transparency on an ordinary slow dry plate, similar to those used for making lantern slides. However, as they are not generally stocked in sizes larger than lantern slide (though they can be got to order), slow or ordinary plates will have to be used; these can be had in all sizes, and will be found to give results almost equal to any lantern plates on the market as far as this special purpose is concerned.

For the benefit of those who have not yet made transparencies, I will say that they are made in much the same way as a print on very rapid bromide paper. The dry plate is placed face down on the negative in a printing frame and given a very short exposure; about one second two feet away from an ordinary fish-tail gas burner from an average negative may be taken as a rough guide. The plate is then developed in the ordinary way—but it will, of course, be a positive, and development should be stopped as soon as the image on the plate looks right by reflected light, judged as in a bromide or gaslight print.

When fixed, it will appear very thin by transmitted light, but when laid on a piece of white paper should look quite strong. The plate can be used as it is, or toned to a desired color by one of the usual methods from bromide paper or lantern slides. I take it for granted that it is understood that the transparencies can be made by either contact, enlargement, or reduction, though, of course, if the picture is wanted the right way round, the negative must be reversed, as afterward it is to be viewed from the glass side. If printing from kodak films by contact, all that is required is to place the film face down in the printing frame; if by enlargement, or reduction, you can either reverse the negative in the enlarger or expose the plate onto which you are enlarging through glass. Reversing the negative is best, as there may be a little dirt on the glass of the transparency which would show on the finished picture.

When dry, the plates are coated on the emulsion side with a silver or gold paint. Ordinary gold or bronze paint (as sold by stationers) or the aluminum paint generally obtainable is all that is required. This can be painted on with a brush in the usual manner, but it is much better if flowed on like negative varnish. To do this, pour a pool of the liquid paint onto the center of the plate, then tilt slightly until the liquid flows to one corner; next it is tilted at another angle until another corner is reached, and so on to the last corner, when the surplus liquid is allowed to run back into the bottle. This method gives a good, even film provided that care is taken to avoid waves. If necessary, a second coat can be given in the same manner. When the first is dry a piece of paper should be pasted over all, so as to avoid risk of scratching. The picture is now ready for framing.

A narrow gilt bead is the best style of frame for this class of picture.

A description of the completed article is next to impossible, but I can sum up by saying that they have much of the brilliancy and relief of a transparency, while the necessity of viewing by transmitted light is avoided.

I can recommend the process as worthy of attention by all classes of photographers. I would also suggest that entrants in competitions try one or two pictures by this method; it will be found that results equally as pictorial as those of the old processes are readily obtainable. Also at exhibitions and displays, such pictures will attract much greater attention than their more ordinary rivals. It may be that they will even successfully catch the judge's eye as especially deserving an award.

I feel sure that professional photographers will find it worth while to turn a few pet negatives into backed transparencies, either for show case or as specimens for orders.—A. P. R.

Illuminating in General

To the portraitist the illumination of the sitter is a matter of such paramount importance that he very often overlooks the very important question of the general illumination of his premises. This point has been impressed upon us by recent visits to otherwise well-appointed establishments, where the very latest and best forms of artificial light were installed for the purposes of negative-making, but where the lighting of the reception-room, and even of the studio itself, were years behind the times. The lighting of many reception-rooms, even upon a summer's day, would lead one to believe that the owners were afraid of letting their customers see the quality of their work. Windows filled with stained glass, sometimes mixed with antiquated transparencies; windows opening into small rock-work conservatories, heavy curtains partly drawn, all help to make a depressing effect, which is not the less evident at "lighting-up" time, when the ill-placed and inefficient lamps, either gas or electric, totally prevent a proper inspection of the work displayed, although they are sometimes effective enough in showing the working-up.

We contrast this state of things with the show-rooms or, we might say, gallery of a firm of commercial designers which we had occasion to visit recently. Here everything was fresh and bright, walls of a neutral tone, and all softly illuminated by light reflected from special fittings, each of which held a cluster of concealed metallic filament lamps. There were no hard shadows and no reflections either from the surfaces of the pictures or the glasses which covered them. Upon making inquiry, we found that the price of such fittings was very reasonable, a sovereign covering the cost of one of medium size, exclusive of the lamps.

It is, however, in the studio itself that the highest point of inefficiency is reached. Except for the arc lamp used for lighting the sitter, there is often barely enough light to enable the visitor to pick his way through the furniture. One or two worn-out carbon glow-lamps, fixed high in the roof, give a sickly glimmer, and serve to emphasize to the sitter the glare to

which he is often subjected. This is particularly felt by children, and especially when the portrait lamp is switched on after they have entered the studio. As it is an axiom that a room should be as brightly illuminated as possible before making flash-light groups or portraits, so it should be when the electric light is used in the studio. In this case the reflected light system is hardly desirable, as a more cheerful effect may be obtained by the use of bracket lights with suitable globes or shades. With modern lamps the question of expense need not prove a deterrent, the cost of current being reduced to a point which enables it in many districts to compete successfully with gas.

The lighting of the photographer's show-window is, as a rule, fairly satisfactory, although it sometimes suffers from a want of adaptability, a fixed position for the lamps not being suitable for all schemes of window-dressing. A few standard lights, with suitable reflecting shades, will often allow of a striking effect being obtained with little trouble. Illuminated signs are not used by the profession to as large an extent as they might be. We do not advocate an emulation of the picture-palace style, but a neat transparent sign, with or without a pictorial center, would often arrest the eyes of those who would not notice the window display, especially in crowded thoroughfares. The idea of illuminating a special lantern inscribed with the words, "When this light is burning, the electric studio is in operation," is not a new one, but such a sign clearly conveys to the sitter with little spare time that he will not be kept waiting while the studio is prepared for him.—*British Journal of Photography.*

Negative Varnishes and a Substitute

ALTHOUGH no practical photographer will deny the efficacy of varnish for preserving much-used negatives, writes L. Tennant Woods, in *Photo Notes*, comparatively few photographers use it. The probability is that there are many like myself who cannot successfully apply modern commercial varnishes, particularly those of the shellac and spirit variety made for use with heated negatives. It is all very well for arm-chair experts to tell us how to apply it, but I notice that most of them always make the bewhiskered joke about more of the varnish going down the coat-sleeve or the arm than upon the film of the negative.

Varnishing with me is a necessity, as I frequently take hundreds of silver prints from one negative in all kinds of weather, and I have found that, however careful one may be with an unvarnished or otherwise unprepared negative, it is impossible to proceed very far with the printing without silver stains appearing on the negative.

I have always been in favor of those methods which enable one to specially treat a negative while it is wet, so that it will dry in a state quite impervious to silver stains, scratches, or other kinds of damage, and as some such methods do not appear to be generally known, not being found in ordinary text or reference books, the formulæ and mode of using may be of service to

those who, like myself, look upon the commercial varnishes as a kind of anathema.

Shellac is unquestionably one of the best bases for varnish, and probably the most widely used, but I prefer it in a watery solution in which the drained negative may be soaked. My formula is:

Borax	1 oz.
Orange shellac	5 oz.
Water	1 pt.

Dissolve the borax in the water by boiling, add the shellac broken up in small pieces, and keep hot until all is dissolved. Then filter, or allow to stand for some days and pour off the clear part from any sediment. The fresher the shellac, and the longer it is allowed to stand after mixing, the better and clearer will be the varnish. If the color is objected to, the same amount of bleached lac may be used in place of the shellac.

The negative, being drained after washing, is placed in the mixture and rocked just as if the solution were a developing or fixing bath. After about fifteen minutes' soaking, the negative is taken out, the glass side is wiped dry, and the plate is then set aside to drain and dry in the rack. If the negative has been allowed to dry before varnishing, the water varnish may be painted on with a soft brush. None of the troubles associated with hot varnishing will be met with, and a good hard and lasting coating will be the result.

Lately I have been in favor of specially treating the film with tannic acid and alum, in order to make the film tough and parchment-like, the following bath being used for the purpose:

Alum	1 oz.
Tannic acid	$\frac{1}{2}$ dr.
Water	8 oz.

The negative is washed well after fixing, and immersed for four minutes—no longer—in the above mixture, the dish being rocked all the time so as to insure uniformity in action. The negative appears to darken a little and become more brilliant, and the film glass-like to the touch. It is then washed for a quarter of an hour and dried as usual. If the negative is allowed to remain longer in the bath the film may buckle at the edges and perhaps leave the glass support. The solution may be used over and over again until exhausted, and the film is made so hard that water may be poured over the surface and wiped off again without injury.

How To Do It

How to get the people interested in your studio and your pictures is the one thing you must do. Other men, who have been long in the business, have played all the schemes listed in the catalogue and they have learned that what will tempt the people at one time will fail in another. In order to get the people in your studio it is necessary to study the people. Reduction in price will bring in one class of people; invitation to an opening and a big bowl of punch might bring in another class. Of course, there is always a larger interest in a new studio than in an old one. It is always much easier to get the people in a small city into your studio than it is in a large one. The question is how

to get them there, and each town and each city must be studied separately until the right way is found, then work this as long as it will work and then go after them in another way.

Once in the studio, the rest is easy if you are the salesman, or have a salesman who understands the people. One of the arguments which can be used, if carefully handled, is to convince the patrons that they have a large number of friends who would be pleased with pictures of them. There is born to everyone just a little admiration of themselves, and they like to see themselves on paper and send this to their friends, and very few object if the photographer succeeds in making the picture a little better than the original.

Whatever you do to induce customers into your studio, always give them more than you have advertised, in one way or another. Convince them that they have received more than their money's worth and they will come again.

One of the best ways we know of to secure patrons and to get people you are looking after into your studio is to have as fine a reception-room as you possibly can, with the best photographs that you can make on the walls. Redecorate it, repaint it, clean it and put up new pictures, and then write out personal letters asking Mrs. So-and-so to visit your studio on a certain afternoon at a certain time. On that same afternoon invite several other ladies whom you know to be her friends, so that when they meet they can have a social chat together, and they get the idea conveyed to them that the other is your customer and if you can make pictures good enough for them they are good enough for anyone. Then get another lot in the next afternoon or the next week, always taking care to invite on the same day, specifying the hour, those ladies whom you know are very friendly with each other.—*Ohio Photo News*.

F. Numbers

THE photographic worker, either amateur or professional, who is at all interested in lenses may, I think, be assumed to have an elementary acquaintance with the numbers (*f*/ numbers) which denote the rapidity or "speed" of the lens. Nevertheless, I have come across plenty of workers of eminence, both in the amateur and professional field, who could not say for the life of them at what aperture a lens was being used, and did not think it necessary that they should have such knowledge of a lens's "speed." I am not saying that their work suffered on that account, but that was probably because they were constantly using the same lens at the same aperture, and thus eliminated speed from the varying factors which govern exposure. However, it can hardly be gainsaid as a general rule that one should know with fair accuracy what are the *f*/ numbers of an objective, and as many old lenses which one may pick up for a few shillings second-hand are not marked at all with the diaphragm apertures, or often are marked with numbers which will mislead the present-day user of exposure tables and meters, I make no apology for devoting one chapter of this series to the subject.

The $f/$ number of a lens, such as is marked on lenses of the present time, is a ratio or quotient. It is the focal length of the lens divided by the diameter of the diaphragm aperture; in other words, the number of times the diameter of the stop will "go into" the focal length of the lens. For example, a lens of 16 ins. focal length with a diaphragm aperture of $\frac{1}{2}$ in. has an $f/$ number of $f/32$. Therefore, to find the working aperture of a single lens, all that is necessary is to know the focal length and to divide this by the diameter of the largest stop, repeating the process in the case of the smaller diaphragms.

For measuring the diameters of the diaphragm, a convenient plan is to cut a wedge-shaped piece of stiff paper, or soft card, of such taper form that the point will pass through the smallest diaphragm but the thick end will not go through the largest. The card should be of such narrow angle that the length which fulfils these conditions is about 5 or 6 inches. Then, in order to find the diameter of each stop, push the paper wedge into the stop, and with a finely pointed pencil make a tiny mark on each side of it where the edge of the stop touches the paper. By then setting a rule across the wedge, with its graduated edge touching these two marks, you can measure the diameter of the stop with as much accuracy as is necessary for practical work. As I have said, the focal length divided by this measurement gives the $f/$ number or working aperture.

The above rule is correct only for single lenses, and only for them when the diaphragm is in front of the lens. For single lenses which are used, as they are in rare cases, with the diaphragm behind the lens, and also for all double lenses where the diaphragm lies between the two components, the method of measuring the working aperture which has just been stated is not exactly correct. This arises from the fact that the front lens causes a certain convergence of the bundle of rays which, passing through it, fall upon the diaphragm, and therefore this latter is not the actual aperture in the diaphragm plate, but an imaginary aperture which is slightly larger. For practical purposes the difference is not enough in nine cases out of ten to make any difference in practical work, but there is a very simple method of determining the exact diaphragm aperture which must be used in finding the $f/$ number of a doublet lens. It is as follows: Set up the camera with the lens fixed to it in the ordinary way and focus upon some distant object; in other words, set the camera at the focus for infinity. Then remove the focussing screen and insert in its place a piece of opaque card, with a needlehole about in the center of it. The readiest way to do this is to cut the card the size of the plate which the camera takes, and to insert it in the dark-slide, placing the latter in its usual position and pulling out both the shutters. If the camera is fitted with single metal slides or is a film camera, it is not a difficult matter to fix the pieces of card in the position previously occupied by the focussing screen. Then take the camera into the dark-room and fit into the lens cap a disk of bromide paper, placing the cap upon the lens, with the sensitive surface of the paper facing the front glass. An inch or two

of magnesium ribbon is now burnt an inch or so away from the card at the back of the camera, when, on developing the disk of bromide paper, a dark circular patch will be obtained which is the diameter which must be used for arriving at the real $f/$ number in the way already described, namely, by dividing the focal length by the diameter. Instead of exposing bromide paper, the needlehole can be pointed to a bright sky and a piece of ground glass pressed against the hood of the lens. The image of the real diaphragm can then be seen and measured, but the plan of exposing a piece of bromide paper is much the more convenient. It should be said that the extension of the camera must not be altered between focussing upon the distant object and the exposure of the bromide paper disk in the dark-room.

So much for the method of finding the true $f/$ number of a lens. I now pass to say something on the various series of $f/$ numbers which are used at the present time and have been employed in the past. At the present time it is customary to provide lenses with a series of diaphragm apertures (usually by means of an iris diaphragm), each of which requires double the exposure of the preceding diaphragm. Thus, $f/16$ requires double the exposure of $f/11.3$, and the latter double the exposure of $f/8$. The exception to this rule is the maximum aperture of modern lenses which work at apertures greater than $f/8$. The $f/$ number which requires an exposure of half $f/8$ is $f/5.6$, while $f/4$ requires half the exposure for this latter, or one-quarter of that required at $f/8$. But generally lens makers, quite naturally, make the lens with the largest aperture at which it will work, and usually introduce an aperture intermediate between this and $f/8$. Thus, many large-aperture anastigmats are marked with the $f/4.5$ aperture, with $f/6$, and then with the series upon the plan just mentioned beginning with $f/8$.

This arrangement is one which, I think, perfectly fulfils all the ordinary requirements of the photographic worker, but in the past other systems of marking lens diaphragms have been devised. Most of these are obsolete and survive only on old lenses, such as one purchases second-hand. Only one is still used for the marking of lenses made at the present time. This is the "Uniform System" devised years ago by the Royal Photographic Society, known by the initials "U. S.," and practically limited at the present time to lenses made in America, or fitted to cameras of American make, a fact which is no doubt responsible for the belief sometimes held that "U. S." signifies "United States." The object of the "Uniform System" was to afford a ready means of calculating the exposure with any stop when that at any other was known. Hence, $f/4$ was taken as a standard aperture and called No. 1, it being recognized that this working aperture is the largest which can be used in ordinary work. The stop requiring double the exposure was called No. 2, and is $f/5.6$. Similarly, No. 4 is $f/8$, and No. 8 is $f/11.3$. I quote here a short table from the *B. J. Almanac*, which puts in a nutshell the two series of diaphragm markings and the relation of each to the relative exposure required according to the stop which is used.

Equivalent F/-and Uniform System Numbers.

Rel. Exposure Required	1	2	4	8	16	32	64	128
F Nos.	4	5.6	8	11.3	16	22.6	32	45.2
U. S. Nos.	1	2	4	8	16	32	64	128

Obsolete Methods of Lens-diaphragm

Opticians in the past have, however, adopted other methods similar in plan and intention to that of the Royal Photographic Society, but starting with a different aperture, as the one to be called No. 1. Thus, the International Congress at Paris in 1889 chose as the standard diaphragm one of $f/10$ aperture, devising the other numbers of the series so that each stop required double the exposure of that preceding it. According to this system, therefore, No. 2 is $f/14$ and No. 4 is $f/20$, while the lenses were marked as $\frac{1}{2}$, $\frac{1}{4}$, and $\frac{1}{8}$, for stops requiring one-half, one-quarter, and one-eighth the exposure at $f/10$. Many lenses of Continental make are still to be found with the diaphragms marked according to the system.

A further system was used for some time by the firm of Dallmeyer, according to which the stop marked No. 1 was one of aperture not $f/10$ but $f/\sqrt{10}$ ($= f/3.16$), the succeeding numbers being devised to require, each, double the exposure of the preceding. Thus No. 2 is $f/4.7$, No. 4 is $f/6.32$, and so on, but it is at least twenty years since any Dallmeyer lenses have been marked in accordance with this system. Two Continental makers did also for some time mark their lenses according to the Dallmeyer standard of $f/3.16$, but choosing other stops, which they designated by numbers representing the number of times of exposure required as compared with $f/3.16$. It may be that lenses by these makers (Goerz and Voigtländer) are still to be found with markings according to this system, although I cannot say that I have ever come across any.

Then another system of marking with numbers which expressed the relative exposures required was introduced some years ago by Zeiss, and, like the numbers of other Continental makers, has long been abandoned. According to this system the stop marked No. 1 was, in the first instance, $f/100$. A stop requiring one-half this exposure was marked No. 2, and is $f/71$; one requiring one-fourth the exposure was No. 4 ($f/50$). Lenses marked in this way can readily be identified with the system from the fact that the smaller diaphragms have the smaller numbers, while with all other systems it is the other way about. Subsequently, Messrs. Zeiss adopted $f/50$ as the No. 1 diaphragm, No. 2 then becoming $f/36$, and so on.

This brief synopsis of the various systems which have been employed covers all the lenses which are likely to come into photographers' hands at the present day. One other system may perhaps be mentioned, as it is still in use by the Zeiss firm and may mislead those who are not familiar with it. In the case of convertible lenses the diaphragms are marked with the actual diameters in millimeters, so that the photographer must find out for himself the $f/$ number when using the lens by itself or in combination with another.—*British Journal of Photography.*

The Photographic Production of a Lithographic Key on Zinc and Aluminum

In order to facilitate the work of the lithographic artist when drawing in crayon on zinc or aluminum, it is possible to first prepare a photographic image on the metal plate to serve as a key, which may then be worked upon in the usual way. This key may be obtained by an application of the blue-print process to metal, though in order to prevent the final image from washing off the plate it is necessary to pay attention to the following details:

A suitable sheet of grained zinc is first coated with a 1 per cent. solution of citric acid and dried immediately. The following sensitive coating is then applied with a brush and likewise dried immediately:

A

Ferric ammonium citrate

(Bown scales) 30 gm. 1 oz. 25 gr.
Water to 150 c.c. 5 oz.

B

Potassium ferricyanide 30 gm. 1 oz. 25 gr.
Water to 150 c.c. 5 oz.

For use: 3 parts A; 1 part B.

After exposing under a negative until the shadows are slightly bronzed, the plate should be washed in water, when a blue image results, though a much stronger image may be obtained if the plate is developed in a solution consisting of equal parts of a 1 per cent. solution of potassium ferricyanide and a 1 per cent. solution of citric acid. The high lights of the zinc may be considerably whitened and the contrast thereby increased by treating the zinc with a weak solution of nitric acid and alum.

A key may be prepared on aluminum in a manner very similar to the method of obtaining the same on zinc. A suitably grained sheet of aluminum is first coated with a 1 per cent. solution of oxalic acid and dried quickly before a fan. The aluminum is then coated with the ferric ammonium citrate-potassium ferricyanide mixture, as in the case of zinc, and rapidly dried. After exposure, the plate should be developed in plain water, though if a solution consisting of equal parts of 1 per cent. oxalic acid and 1 per cent. potassium ferricyanide is used a bluer and slightly more intense image is obtained.

Photographing Animals

In animal photography the first great essential is an unlimited amount of patience. There is no rule to follow, but try and make friends with the subjects even before bringing them under the skylight, also allow them to play about the room.

Have the stand or table about where it will be needed (that is, if one is used), the background, reflector and camera in place then

bring subjects into the room, having no persons other than the owner present. One should have a number of holders loaded with either Seed 27 or 30 plates, as these are the fastest plates and give fine detail.

When focussing note how much the subject may move and still be in focus, then insert the holder and expose as they assume the different positions. It may be necessary to allow them to jump down and run around, and by all means allow them to, for it is impossible to force them to keep a position.

Extemporized Backgrounds

So often is a background extemporized out of a shawl or a blanket, that it is surprising that this very simple method of concealing all creases, irregularities, etc., in such a ground is not used far more often. It can be described in three words—Shake the background. Portraits are usually time exposures, and it is easy enough to get some third party to keep the background moving during the time of exposure, so that all texture and other details on it will disappear in the picture, and all that will be visible will be a smooth even tint. If there is no third party to do what is required, a string may be fastened to the pole which carries the background and given a few sharp pulls.—*Photography.*

Shadow Side of the Face

CONTRASTS are always stronger in the photograph than they appear to the eye. Frequently the shadowed side of the face seems to our vision full of the richest, detail and truly our eye is not deceived, for the detail is there, but in the finished portrait we discover, for some unaccountable reason, our deduction being based on appearances, that the expected luminous shadow areas have degenerated into mere meaningless black masses.

The eye is thus contributory to a false judgment of what the light is really effecting upon the film. We must not forget the influence of the mechanical phase of our art. We must bear in mind that the art is not in the camera or plate, but in ourselves. The plate remorselessly registers intensities without appreciation of exterior appearances.

When we predetermine that the shadows shall not disappoint our artistic expectation, we must take precaution that the unmeaning black areas do not predominate. We must either introduce direct light on the shadow side or rearrange the illumination to throw light in that particular part. To the trained eye the effect produced is at once manifest and the improvement directly visible.

By increasing the amount of front light, the time of exposure is relatively shortened. The whole scheme of illumination is more harmonious. The light and shadow contrast more and more decidedly by moving the model toward the source of light.

It is best to use the reflecting screen with caution. That is, use judgment, and not to overdose the shadow side and obliterate the fine detail.

The good agency of the reflected light from

the floor or the walls of the studio is not always appreciated. It often is valuable in lighting up the shadows. Every radiating object near the sitter acts as a reflector and sometimes it happens that an unexpected blessing is conferred, a charming result obtained without the operator's intention or the divining of the immediate cause of success.

This kind angel in disguise may have been the book which the artist placed in the hand of the model to complete the composition, but he builded better than he knew, or it may have radiated from the drapery or the garment of the model. Whatever the cause, the credit belongs to the photographer, provided he understands the cause and subsequently appropriates it.

Developing Gaslight Prints

THE greater number of photographers who use it appear to develop gaslight paper in a bath of developer, immersing each print entirely in the liquid. Having developed a good many gross of gaslight prints up to 8 by 10 in the way I shall presently describe, this mode of immersion, used by many, appears to me particularly wasteful. There is also the chance of air bells, etc., which frequently show on prints so developed, and the developer is so much sooner worked out. Of course, I do not claim any novelty in this method, as I did not originate it, but I have never noticed this way mentioned in the many articles on gaslight papers that I have read.

I use generally a plate of glass, clean, and 8 by 10, or larger, in size, and, in my own case, lay this across two narrow pieces of wood, which in turn lie across a tray larger than the glass. On this glass the developing is done, and the tray underneath is merely to catch the drip and prevent it going all over the table or whatever one may be working on.

If you have the luxury of a sink and water tap in your dark room, you can put the glass over the sink. Near at hand I have a small measure glass, with, say, 1 ounce of developer in it, and at one side a tray of clean water. After exposing the print as usual, it is placed face up on the glass, and, taking a piece of absorbent cotton, dip it in the developer in the measure glass, getting it thoroughly wet, and then rub it over the face of the print, first lengthwise, and then across, or *vice versa*, not forgetting the edges, which sometimes appear to have a habit of coming out a little slower than the center.

Continue the rubbing until all streaks have disappeared and the picture appears even and sufficiently dark, then transfer to the clean water for a rinse, and immediately put into the acid hypo bath.

The rubbing, of course, must not be too hard, though it is wonderful what the paper will stand. Rough surface paper must be especially gently dealt with, and the edges of all grades must be gone over carefully for fear of turning up the thin film of emulsion.

Prints can be wetted before developing, if preferred, but in this case the water should be allowed to drain off a little, and it will be found that the developing will take a little longer, in

consequence of the slight dilution of the developer. The wetting of the print first will, however, insure even development, and it is advisable in the case of prints larger than 6 by 8. Personally, I prefer to develop the dry print.

A certain amount of local development can be done in this way, by rinsing off the developer when most of the print appears finished, and applying the cotton to the part which is slow in appearing. But it is advisable always with gaslight papers to expose properly rather than to force any part, as prolonged development almost invariably produces stained prints.

Remember to rinse off the glass plate every now and then, and to take a new piece of absorbent cotton for, say, every three or four prints. Absorbent cotton is cheap, and using one piece too long may result in brownish or greenish prints. The size of the piece of cotton may be left to the worker. The writer uses a piece about the size of a large walnut.

Using this method of development, it is really surprising how many prints can be done with a very small quantity of developer, and as to the question of time employed, I find it as quick a method as any other I know of, and I have a good deal of this work to do in a commercial way.

One other note I would like to add. Prints can be dried unmounted best by placing them face down on clean white cotton cloth or calico, provided the fixing bath contains alum, as in the bath prescribed for Velox or Cyko paper. If alum is not used they will possibly stick to the calico.

A Few Rules I Have Found Good to Follow

Making Sittings of Children. Use plenty of light; do not be afraid of using too much, for the more you use the better the negatives will be. Bear in mind that more light means greater softness and roundness. The light should fall from the front, both side and top. Children's faces do not show any character, so that the light may be as strong as wanted without destroying the likeness. Another great advantage in using a large source of light is, of course, to be had in making the sittings quickly. I make all children's pictures in snapshot work. This may seem bad policy to the one who believes in the long exposures, but, as stated above, I have not found that it destroys any of the character, and inasmuch as I get a fully timed negative by using a large source of light, the negatives show plenty of strength. Also, I use, as a rule, light grounds for children's pictures. I have always associated the lives of the little ones with light and sunshine. Make their pictures show it. A child is all out of place when shown in a picture as though he were sitting in a dark room. Children do not like night or dark rooms, but they do like sunshine and plenty of it. It is their nature, and why not show them that way?

Old People. Of all the subjects that come to the studio, I would rather photograph the old folks than any. Every face means something, and every line in the face means some trial overcome, some story that we all could profit by if it were not for the fact that we all have

to learn by actual experience. For such subjects I use the light from a lower source, working it more from the side and rather farther to the rear of the subject than usual. Do not try to fill every line and wrinkle with light, thinking it will better the picture. It makes it weak in character. A better plan is to use the lens open—that is, without a diaphragm—and focus well up on the end of the nose, so that the face may be in a soft, delicate diffusion. Far be it from my intention to recommend the fuzzy, woolly type stuff that is often seen, but a soft, diffused focus gives to the old face the softness of age without destroying character and without exaggerating the lines, as is often done, both intentional and unintentional. Some operators seem to think character expresses more than a delicate handling of the lines.

White Draperies. Pose the subject close up to the light and use a very small opening; in fact, some of the very best things I ever made was by an opening no larger than a window. This allows the operator to concentrate the light directly at the face of his subject, and the drapery is thrown down in a lower tone by reason of the light being too small to spread all over the entire figure in even strength. Also, the figure should be turned a trifle from the light if perfect detail is to be secured. By having the figure turned from the light it throws the front of the figure in shadow, and the shadow, of course, holds back the details and thus prevents the drapery from developing ahead of the face to the extent that the detail would be lost in it.

Dark Draperies. Use light falling from the front, and have the top light a little in excess of the side light and the figure facing more to the light. Better detail is the result and less screening is needed. Be sure to time for the deepest shadow in the drapery if it is to show the detail. One cannot get the detail if the exposure has been too short. The face must be toned down so that there is an even blending of the lights into the shadows, for if this is not done the lighting will be harsh, and the face will stand up like marble while the drapery will look more like a charcoal drawing.

Hollow Eyes. The light must fall from the front and low down. This means that the operator must use his light low enough on the side so that it can get into the eyes. Bear in mind that light does not bend out of its course, and if it is falling from above the subject it cannot bend out on the brow and then bound back again to get into the eyes. The operator must so arrange his curtains that the light is directed into the eyes, and it will be found that when this is done it will be from a lower point than he is in the habit of working the light. The little catchlight that should appear in the eyes can only be gotten by the use of a light that is low enough to fall across the nose just at its root, so that really the light passes between the two eyebrows, over the top of the one on the light side and under the one on the shadow side, and thence into the shadow eye, and the catchlight is the result.

Long Neck. Turn the subject's body a trifle from the light and the face back to the light and lower his head. By so doing the chin comes

down toward the shoulder nearer to the camera and the line of the neck is visibly shortened. At the same time the camera should be raised above the subject's nose, so that it really looks down on the chin.

Long Nose. Raise the subject's head and lower the camera, so that it comes under the nose and allows the nostrils to show from the lens.

Short Nose. Raise the camera and lower the subject's head, so that the nostrils can barely be seen.

Long Face. Use front light and rather diffused. Make a three-quarter view of his face, unless he has a hollow cheek, when it is a good plan to allow the ear to just fill the hollow of the cheek on the shadow side of the face.

Short Neck and Round Face. Have the subject stand, even though a bust negative is to be made. This allows the shoulders to fall lower and the weight of the body is pulled downward, so that all features and members are elongated. Make almost a profile and use very strong light from the side and no reflected light on the shadow side of the face. Remember that contrast gives a lengthening effect to a round face. One reason the moon is said to be full is because there is no shadow on it, and the result is that it is perfectly round. The same is true to the one with a short neck and round face.

Bride and Groom. The bride should be posed on the light side of the picture—that is, on the side next the light. This is done so that a small opaque screen can be brought close up to her and screen down the drapery, so as to show the detail in the whites. At the same time, the groom being farther from the screen than the bride, the light falls over the top of it on his black clothes and thus gets the detail in the blacks.

Hands. Be careful to allow just a trifle of the cuff to show in the man's picture, for it makes the hands appear smaller than anything else can do. Also, as a rule, the hands should be posed somewhat to the side, so as to appear smaller, and should not be placed directly under the face nor in line with the face. They should be screened somewhat, so as not to be lighter than the face.

Blondes. Use a low key of light, so as to get all of the strength possible. As a rule, the blonde appears to be lacking in strength in the picture unless so handled. Some shadow effect is good, but do not make the mistake of making a contrast lighting, thinking it is a very low key. A low-keyed lighting should have just as much softness as the high key. Soft, delicate detail should be seen all through the entire lighting.

Brunettes. A higher key of light, and the face so toned down that it is brought in closer touch with the hair. The hair, being black, will lack detail if the face is not toned down so that the exposure can be given long enough to get the details in the hair.

Glossy Flesh. Where the flesh is moist it makes the high-lights stand up too strong, and the result is a harsh lighting. If a powder puff is passed lightly over them with just a suspicion of powder on it, it will kill the gloss and the lighting will be more even and show better detail in the high-lights.

Dry Flesh. Sometimes the flesh is so dry and of the same tone that the results shows the face to be flat, with no half-tones. If the operator will have handy a small vial of oil, which has been scented up with lavender water, and just touch his finger to the mouth of the bottle, getting the smallest bit of oil on it, and then touch the flesh where the high-lights should appear, he will get much better roundness. Too much oil will give a harsh effect. The lavender water is to make the oil have a better scent.

Staring Eyes. Light the subject in a very low key of light, so that an exposure of several seconds has to be given, and then have the subject wink the eyes several times while the exposure is being made. The winking of the eyes does away with the stare.

Sleepy Eyes. Have the subject lighted in a low key of light, so that several seconds' exposure has to be given, and then have him look directly in the center of a large black background or black cloth. The eyes will expand somewhat and the expression is much better and more animated.

Crooked Nose. Show the side of the face that has the hump of the nose. Do not photograph into the hollow of the nose, as that makes it appear worse. Use broad lighting, falling from the top and front, making the shadows fall more downward.

Mouth That is Lower at One Corner Than the Other. Pose the subject so that the head may be tilted toward the side that is higher. This lowers the corner that is higher and raises the corner that is lower, and the mouth is made to appear straight. By "tilting" the head I do not mean to turn the head, as that is quite different. I mean to tilt the top of the head to one shoulder or the other, whichever is needed.

High Cheek Bones. Use front light, from top and side, and make a front view of the face. The light should be soft and the shadows full of detail.—FELIX RAYMER, in *Trade News*.

Tinting Transparencies

A LITTLE careful tinting is a great improvement to a good transparency; a tastefully tinted slide is as far in advance of a toned slide as the latter is of the cold black and white monotony which so frequently makes it appearance during an evening's entertainment. Of course, this is rank heresy, for everyone knows what an inartistic abomination a colored slide is; but in this case we are not dealing with gorgeous commercial productions, but with a home-made transparency, in which the main features have just that suggestion of color which so materially assists in adding atmosphere and atmospheric perspective where otherwise the methods of production hardly permit those desirable features to exist.

The method of tinting slides which is here to be described is a simple one, and no knowledge of artistic manipulation is necessary in order to produce decidedly pleasing results. The one thing which must be borne in mind is to apply all tints lightly; it is a suggestion of color rather than the actual thing that should be aimed at, otherwise we shall soon find ourselves encroach-

ing on those wonderful emerald skies with purple clouds so dear to the heart of the professional "brother brush." A finger-dabbed firmament in Prussian blue is more suited to the "Bertillon" system of identification than the regarding of an artistically appreciative audience; we cannot, therefore, too strongly insist on the necessity of avoiding bold coloring, as the unavoidable crudeness of the more transparent colors absolutely compels careful and discriminate use in order to maintain that mellowness of tone peculiar to nature.

The clearest way of showing the method to be employed when tinting gelatin transparencies will be to imagine a subject, such as a landscape, composed of sky, distance, and foreground with foliage; but before commencing on our subject it will be well to draw up a short list of the materials required; and to avoid the trouble of mixing tints a fairly full palette should be selected.

My own plan has always been to purchase one pennyworth of the aniline color in crystal form, and then dissolve it in two ounces of distilled water. This is a decidedly vague receipt, but its simplicity should prove a recommendation, and, after all, the strength of the color is immaterial, provided it be not too weak to give the deepest tone desired. Colors can, of course, be thinned to any extent by adding water to them on the palette.

With regard to brushes, two, or at most three, will suffice—a camel-hair mop, about the size of the little finger, and two sables of different sizes, both fairly small. These are the absolute essentials, and nothing else is required, unless, when dealing with some exceptionally difficult and intricate subject, in which case crystal varnish and an additional brush must be procured.

We will now commence work on our imaginary transparency, consisting, as above indicated, of sky, distance, and foreground, with foliage. The colors required will be blue, brown, and red. Place the transparency in a convenient-sized dish (say, 4 by 5) to soak, leaving it there for about five minutes, and while this is taking place mix a little of the blue with about four times its bulk of water on the palette. Now take up the transparency in the left hand, and after slightly draining it hold it in a horizontal position, and mop on the pale tint of blue, so as to cover the entire surface, including sky, distance, and foreground. As soon as the gelatin is lightly stained (say, in two to four minutes) plunge the transparency in the dish of water to remove the surplus color, and then lift it out, this time keeping the plate vertically inclined, with the sky downward. More color must now be mopped on to the sky, beginning at the horizon, and allowing it to flow toward the zenith; finally, when the sky is dark enough, the surplus must be once more washed off by immersion in the water dish. At this stage allow the slide to dry for about five or ten minutes in a horizontal position; face down, with the four corners resting on an old plate box, is the best way, as it lessens the danger of dust falling on the moist gelatine.

The brush should now be well washed and some clean water placed in the dish preparatory for the second painting.

Take some of the brown tint and mix it with water on the palette, taking care that the color be not too strong. Now hold the slide over the water dish, sky upward, and go over the distance, foreground, and foliage with a clean brush dipped in water, and afterward with the brown. By holding the slide almost horizontally, the brown color may be accumulated on it, the greater depth, however, being allowed to rest on the immediate foreground. It is by this method of flowing the tint, much as varnish is used on a negative, that the most delicately graduated tones are obtained, and the color may be worked from the palest of yellows in the distance to a tint of gradually increasing strength, which adds wonderfully to the effect of distance, and hence atmosphere, and at the same time brings the foreground up to our very feet.

As soon as the brown has done its work the surplus color must be removed by plunging the slide in the water dish, and after a very little draining it may again be partially dried for five to ten minutes, while the brush is again washed and the water in the dish changed.

The general appearance of the slide now, if all has gone well, is a graduated blue sky considerably stronger at the zenith than at the horizon, while the remainder of the picture is graduated from distance, or even the tops of the large trees, to the foreground in a mellow tint of green in gradually increasing intensity.

The third and last tinting consist in applying a second coat of brown to such parts of the foreground as are best represented by that color, always being careful to go over the part with a wet brush first, and finishing without washing the slide, as in previous paintings. The distance is sometimes much improved by filling the brush with a very thin tint of red and then passing it once or twice gently along the horizon, thus slightly warming both sky and distance. If there are any figures in the picture they should be picked out in much stronger tints than have hitherto been used, and this should be done when the gelatin has dried for a quarter of an hour or more, in order to avoid the stronger tints running, which they are very apt to do if the slide is too moist.

This practically concludes the simple process, and if entire satisfaction is not felt in the result, twenty-four hours' immersion in a pint of water will remove every trace of color without doing the slightest harm to the transparency, which may be retinted and washed several times until the desired effect is attained.

Developing Large Plates

It is not the lot of every photographer to undertake the production of large negatives. When such work is taken in hand there is oftentimes some hesitation in the application of the developer. The plates being costly, the results must be the best that can be obtained. Generally, a test plate of 8 x 10 size is tried in the first place, these plates having been coated with a portion of the same emulsion that is employed in the coating of the large plates. This will enable a correct exposure being made upon the

larger plate. Such tests only apply when the exposure is made in the studio, as in the case of copying and enlarging. When a portrait is to be made, or a large view, the photographer must rely upon his previous knowledge of the general quality and rapidity of the plate. Take, for instance, such a view as the skyline of New York City, upon a plate 25 by 40 inches. Correct exposure and great care in developing are essential to produce a good negative. In the case of a portrait upon a plate 25 by 30 inches, correct development is absolutely necessary.

In such cases it has always been the practice of the writer to wet the plate thoroughly in the first place before pouring on the developer. The tray being thoroughly clean, it is filled to a depth of one-third with clean, cold water, the exposed plate being placed therein, and the tray rocked gently, so as to prevent air bubbles being formed upon the surface, the developer being already mixed for pouring upon the plate after the water has been poured off. Of course, the water must be allowed to remain upon the plate until a perfectly even, wetted surface is the result, so that no streaks are formed when the water is poured off.

An excellent developer for large plates is made up as follows—one that can be relied upon. There must be no experimenting with these expensive plates; good results must be obtained every time: Make up a solution of carbonate of soda to test 60 on the hydrometer; then make up another solution of sulphite of soda to test 40 on the hydrometer; take equal parts of each and mix them in a third bottle; mark this "mixed sodas." Prepare a solution of pyrogalllic acid to measure 20 on the hydrometer; take 8 ounces of this, add 20 grains of oxalic acid, shake the whole until the oxalic acid is dissolved. Make up a 10 per cent. solution of potassium bromide by dissolving half an ounce of potassium bromide in 5 ounces of water. Having these solutions ready, the developing agent must be made up as follows: 8 ounces of the sulphite of soda solution at 40 hydrometer test is taken and poured into a large glass graduate, and add 1 ounce of the bromide solution and 1 ounce of pyrogalllic solution, 2 ounces of the mixed sodas, and 24 ounces of cold water; call this No. 1. Mix in another graduate 1½ ounces of pyro solution, 8 ounces of the mixed sodas, and 24 ounces of cold water; call this No. 2. Now take 12 ounces of the first pyro mixture, and 12 ounces of the second. There are, in fact, two developers; they give very soft results. Pour this mixture upon the plate with one clean sweep, tilt the tray so as to give an even flow, watch the result. Generally this combination of developers will give a beautiful negative; if the development is proceeding all right, allow it to continue; if the image is coming up a little slow, then add 2 or 3 ounces of the strong No. 2 developer; the image will soon gain in strength. If the image is developing too fast, pour off the whole of the mixed developers, and, without washing, pour rapidly into the tray, all over the plate, the balance of the No. 1 developer. This will check the action at once; it will keep the shadows from being acted upon unduly, and the high lights will gradually build up to the required density.

As soon as the plate is fully developed, tilt the tray, drain off the developer, and flood the plate with clean cold water from the faucet. Wash the plate well, carefully lifting it so as to wash out every trace of developing solution from beneath the plate.

The fixing is best done in a chrome alum hypo fixing bath. This will give a clean, clear image. Always allow the plate to remain in the fixing solution for a quarter of an hour after fixing appears to be complete. This will insure a negative that will not turn yellow in the course of time.

The negative must be washed several times, then placed in a solution of common alum of 5 per cent. strength and rocked gently for fully five minutes. It must then be removed and washed in running water for an hour, and finally the surface very carefully wiped with a large tuft of wet absorbent cotton, rinsed well under the faucet, and placed upon clean blotting-paper or in a suitable rack to dry. The result will be a perfect negative in every particular—one that will be fit to print from in either silver, platinum, or carbon. The use of the two developers will enable the operator to control the development in such a way that no other plan offers. The value of a large negative being such that great care and pains are required in its production, it will not matter if the time of exposure should be a little under or a little over or just right. A thoroughly good negative can be made by the above method of developing. It can be made contrasty, or soft, or anything intermediate. The mixture of the two will enable the operator to judge the quality in a very short time, so that he can add either of the developers No. 1 or No. 2 just to suit requirements.

As a transparency developer for the making of enlarged negatives, No. 1 developer cannot be surpassed. It is slow in action, keeps the shadows clean, produces a very fine color, very much like ferrous oxalate. If an enlarged negative is made from such a transparency when it is only surface dry, the negative cannot be distinguished from one made direct, because the transparency thus made is almost grainless, and possesses just the color that is highly suited for the enlarging process.

Various colors in the deposited image can be obtained by mixing the proportions in a pyrogalllic developer. The writer has used many other developers for large plates, but for certainty of action and reliability in securing a good negative, and securing such a negative every time, the pyrogalllic developer is the one to be relied upon. Employed as described, there need be no fear of not securing just the kind of negative desired.

Never use this developer a second time upon a large plate. There is a risk of staining and a deception in the right depth of density during development. Always use a fresh solution; then a good negative will be the result every time.

A DARK band across the middle of a carbon print is generally due to bringing the squeegee down at this place when squeegeeing to single transfer paper. The squeegee should be started at the end.

Rules for Success

CAN'T say about the other fellow striving for artistic and financial success, but as for myself I find that TRYING to live up to the following set of sixteen rules is slowly but surely bringing me a measure of the success which I have been working for. I give them here for what they are worth.

1. I put the utmost into my work that "within me lies."

(Have yet to make the first picture that satisfied me.)

2. Advertise to the extent of 15 per cent. of my gross business.

(Daily papers and booklets exclusively.)

3. Undeviating prices commensurate with quality.

(Do not be afraid of getting them too high. You will still have enough fear left to keep them within reason.)

4. Change my showcase regularly once each week.

(Case holds two pictures, one on each side.)

5. Employ receptionist who knows how to sell my product.

(Get the best to be had at any price.)

6. Try to be invariably courteous, cheerful and optimistic.

(All three of equal importance.)

7. Never, never knock competitors.

(Cannot overestimate the importance of this.)

8. Demand and get utmost cleanliness throughout studio.

(One of the hardest things of all.)

9. Take a good long vacation each year and attend all conventions possible.

(This will prove money in your pocket, not to mention health.)

10. Always willing to learn from salesmen and demonstrators.

(They all have something good for us and are invariably willing to impart it.)

11. Read the trade journals.

(Can't keep up-to-date without them.)

12. Keep equipment up-to-date.

(Advertising pages of trade journals keep us posted.)

13. Use artistic and exclusive mounts.

(Something the patron cannot get elsewhere.)

14. Send out proofs in a neat and artistic manner.

(Mount proof in portfolio, one to the page, wide margins.)

15. Send out finished work in neat and finished manner.

(Neat, white tissue-paper package with artistic gray seal is good.)

16. Use refined stationery.

(Appropriate to the class you are trying to reach.)

There are a thousand and one more rules quite important.

(But the above are the most important as I find.)

You know all this as well as myself; the thing is:

"Do you put it into practice?"—R. MORRIS WILLIAMS.

Exposure and Size of Plate in Wide-angle Photographs

IN the general case of wide-angle views it is well known that an exposure just sufficient for the center of the plate will be altogether inadequate at the corners. The falling-off of the illumination at the corners is, of course, influenced very largely by the cutting-off effect of the lens mount when the aperture is over a certain size, therefore for high-speed work at large aperture we need a lens giving a fairly wide angle of full illumination. The mount nearly always cuts off some light, but by stopping down the aperture we can increase the angle of full illumination very materially and so avoid any interference by the mount up to very large angles. In that case the uncertain effect of the mount is eliminated, the illumination of the plate varies according to a definite rule, and it becomes possible to calculate the difference in exposure required as the distance from the center of the plate increases.

According to the rule given by Doctor Zschakke, the light entering the emulsion at any point on the plate is proportional to the fourth power of the cosine of the angle of obliquity of the light pencil, so that if this angle is θ , the light everywhere is proportional to $\cos^4 \theta$. We can then use this rule to determine the relative exposures at the corners and at the center of the plate when a sufficiently small stop is used to make the angle of full illumination cover the whole plate. Taking an angle of 90 degrees, for example, with which the diagonal of the plate must be twice the focal length, the corners require four times the exposure necessary at the center. With an angle of 105 degrees the corners require seven times the exposure at the center. With extreme wide angles this must always be the difficulty. Hence the origin of various patent lenses with revolving star stops, etc., designed to cut down the light in the center of the plate.—*British Journal of Photography.*

Use of a Mirror in Portraiture

THERE is nothing original or new in the idea of making a photograph of a reflection in a mirror, but it is a useful expedient that does not seem to have been often employed. When the space available is too small to permit the use of a long-focus lens, by introducing a mirror a viewpoint in effect is obtained beyond the wall of the room. The camera and sitter may be placed close together, with the mirror facing some point between them. The exterior focal distance is then the sum of the distances of the mirror from camera and sitter.

The negative naturally is a reversed one, and is only suitable for printing direct in single-transfer carbon, unless films are used, which can be printed from either side. If the negative is for enlargement, the reversal is of no consequence as it need be merely turned around in the carrier. By employing a lens with a slight amount of spherical aberration a most pleasing and even softness of definition is secured. Probably this is due to the fusion of the main and secondary images respectively reflected from the back and front of the glass. It gives to the image a certain luminosity of a somewhat similar character to

a direct print from a negative made with a soft-focus lens. The texture of the image is not destroyed or even impaired, but there is a slight blurring outward from the *high-lights*. This gives an entirely different effect from that obtained in a direct bromide enlargement with layers of tulle on the projection lens, which produce an outward blurring from the *shadows*.—*British Journal of Photography*.

Hints on Photographing Automobiles

It is frequently desired, when an unusually good job is turned out, to photograph automobiles and commercial trucks, the photographs sometimes being destined for publication in magazines and newspapers, but more often for the reference files of the factory or for the salesman's sample case.

A few hints on photographing automobiles, trucks, carriages and wagons, are printed below, and it would be well, when taking a picture of this kind, to note the points covered in this article. The hints were written by an expert photographer who obtains uniformly good results in photographing motor cars.

1. The background of the automobile should be light, so that the automobile stands out in bold contrast. An unobstructed sky is probably the best background obtainable, except when the car is painted a very light color. Avoid fences and buildings, as they conflict with the lines of the automobile.

2. In photographing automobiles, it is best to choose a rather dull day in order to avoid strong shadows and "halation" or glare, from the highly polished surfaces of the car. It is also best to use a non-halation dry plate for this work.

3. The photographer should carefully scrutinize the polished surface of the automobile to ascertain whether there are any reflections of the surrounding buildings, scenery, etc., on the varnish. All of these reflections would show up in the completed photograph. We saw, recently, an undertaker's car, painted black and highly varnished, which illustrated a very pretty picture of a children's playground, with the youngsters and the paraphernalia of the playground showing very clearly in the picture. All this was the result of reflection which could have been avoided by a little care.

4. The camera should be placed in such a position as to take a correct side view of the car. A long focus lens is the best.

5. A very important point to observe is that the automobile should be standing on level ground, so that the vertical lines on the automobile will appear vertical on the photograph. Even on level ground there is a tendency for the lines of an automobile to appear as if leaning forward. In this case weights should be placed in the body of the car in order to straighten the lines on the photographer's ground-glass plate.

6. Be sure that the tires are well cleaned. Nothing is so unpleasant in a good photograph as the appearance of tires splattered with traces of mud.

If the above instructions are carefully followed and the photographer engaged is ordi-

narily competent, there is no special difficulty in obtaining excellent photographs of any sort of automobile, truck or horse-drawn vehicle.—*Bulletin of Photography*.

Incongruous Background

ONE frequently sees, even nowadays when the taste and perception of photographers generally has so greatly increased, an incongruity between the figure and the background. The young lady in evening dress standing on a strip of carpet placed on the wet seashore while the gale destroys the shipping in the offing is a very glaring example, not however quite unknown. Of course, a great many of the classical backgrounds in portraits by the masters savor of the unreal and absurd, but most of them are so subdued in definition and contrast that the effect is good, and it is only when the picture is much enlarged that the incongruity is seen. It will usually be found that the outdoor background is more difficult to use than the indoor one, for while a lady may be seen indoors in practically all styles of dress there are many in which she would not be seen out of doors. Conservatory and terrace pictures might admit of the use of evening costumes, but it must be remembered that the opportunities for wearing such dresses in daylight are practically nil, as, even if the dinner hour is an early one, midsummer twilight has come down before the meal is over. Another kind of incongruity is the photographing of people who are obviously of middle-class position in baronial halls. It is sometimes argued that many people want to look as though in a better position than they really occupy, and that we are all, in fact, snobs at heart. But if this be so, the desired effect might be better attained were it arranged so as to look a little more like the truth. Making the very best of things is quite a different matter from an obvious incongruity of setting, and we think most people nowadays prefer this form of flattery applied delicately rather than plastered on with a trowel.—*British Journal of Photography*.

Imitation of Artistic Methods

FROM time to time a good deal is heard of the imitation of the methods of the painter or engraver by the photographer. Much of this is due to a quite erroneous supposition on the part of certain critics that a deliberate attempt is made by the photographer to imitate the appearance of a certain form of drawing. Nine times out of ten the supposed similarity is quite accidental. M. Demachy has remarked on the peculiar beauty of a fine black, quite apart from any form, but simply as black. So a print may have a certain quality which is charming in itself and also by reason of association. Demachy himself once wrote: "For my own part . . . I shall always experience in the contemplation of a gum print which unites certain qualities of a fine mezzotint, a quite peculiar sensation of pleasure which would not be given to me by another one which should be as like as two peas to a lovely bromide. I am not ashamed to own it." Here it is clear that it is largely the quality which characterizes the

mezzotint and may also characterize a gum print which contains the charm. Since this was written, M. Demachy has perfected the oil process and obtained by its aid the same peculiar quality of blacks, yet no one would suggest that his oils are an imitation of his gum-prints. Surely the professional worker is justified in using any of those methods which will give quality to his prints, if by study of examples of stipple engraving and of mezzotint he can obtain in his photographs the same gradation, range of tones, and fine general quality.—*British Journal of Photography*.

Copying and Enlarging in One Operation with a Box Camera

COPYING a photograph is usually accomplished either by buying a special camera with a special lens or by paying a professional to do it. Both courses are expensive to those whose "hobby-money" is limited.

The copying is done with a box camera at a cost of ten cents and a little ingenuity.

A piece of ground-glass was purchased of the standard size of the plates taken by the camera (quarter-plate), at a cost of fourpence, and this was fitted into the space in the camera usually occupied by the first plate. The lens was simply one of the focussing lenses of a five-shilling magic lantern, temporarily fixed on to the front of the camera by a piece of plasticine. Having fixed the lens on to, and the ground-glass into, the camera, the head was focussed upon the ground-glass in the ordinary way. In the writer's case the image was in sharp focus when the camera was about $3\frac{1}{2}$ inches from the subject. The exact position of the camera was then marked, the ground-glass removed and a plate inserted, the camera returned to its former position, and the exposure made.

The exposure given must vary, of course, with the intensity of the light; but in the particular case in question the exposure was two minutes indoors on a dull day. A window was on one side at a distance of about eighteen inches from the original, while a reflector was arranged on the opposite side. Contrary to my expectation, the lenses used appear to have good covering power except at the edges; but in the case of a portrait such as the one here reproduced, a little falling off near the edges is unimportant.

It will readily be seen that this method may be of much use to those who have a lantern from which the lens can be temporarily removed. They may have photographs which they value, but in which the faces are rather small, and they would like perhaps one face enlarged and made a picture of in itself, but cannot afford the expense of a proper camera or the cost of having the work done by a professional photographer.

It is possible also to enlarge to a respectable size with a box camera photographs of small flowers, living creatures, valuable postage stamps and knick-knacks, which in the usual way may be insignificant when seen on a small plate and among a lot of others.

The method, of course, is not limited to a camera with a single lens. A friend of the writer,

having a magazine camera with a rapid rectilinear lens tried the objective from another lantern with equal success.—*Photography*.

A Hint on Photographing Machinery

MACHINERY often has to be photographed where there is a poor light, while the subject itself has some parts shining like mirrors and others painted a deep green, red, gray, or black. Much can be done, says *The Professional Photographer*, toward reducing the harshness by a liberal use of a diffusing material, such as butter muslin; but light-softness must be employed in the right way, or it will be worse than useless. Suppose, for instance, that the machine is in a room where there is only one small window. If the muslin is tacked over the window it will do little or nothing toward diffusing the light; it will necessitate a longer exposure, but that is about all. The muslin should be used in the way a head screen is used in the studio; that is to say, it should be hung up between the machine and the window, as near the machine as possible without letting it show in the photograph. This arrangement allows all the light to come into the room, and softens only that which falls directly on the machine.

Spots and Markings on Negatives

No article of moderate length can attempt to deal with all the defects which are possible, many of them as the result of sheer inexperience in handling materials like gelatin dry plates. Such markings as mottling, due to omission to keep the developer in movement, and others of that kind I must leave out of consideration here on the ground that they are defects the cause of which is pretty well known even to those who are comparative beginners. Also I have no need to refer to markings such as are rarely met with nowadays on plates, however much of a trouble they were to workers of a generation ago. Still, there is one of these which perhaps I may mention in passing, since it may arise even nowadays with those in hot countries who are compelled to make extensive use of the alum bath as a preventive of frilling. I don't know to what extent the trouble is met with by workers in the tropics with present-day plates—I should guess very little—but years ago one often encountered scummy, leather-like, patchy markings arising from the use of the alum bath between development and fixing, and due chiefly to insufficient washing both before and after the employment of the alum solution. Nowadays the worker who is under the necessity of having to harden the gelatin film can make use of formalin in place of alum or can employ a fixing bath containing ordinary or chrome alum, a method which is less liable to give rise to these markings than is the separate use of an alum bath.

Light and Dark Bands

To pass, however, to one or two other descriptions of marking. A light band extending right across the negative is sometimes caused as the result of a partial desensitizing action upon the

plate by the material used for the hinge of the dark-slide shutter. The effect is not likely to arise except when plates are kept for some considerable time in the slides. Where slides are found to give a marking of this kind perhaps the easiest thing to do is to paint the material of the hinge with a little solution of potass permanganate, afterward leaving the slides with the hinges fully exposed to broad daylight for a day or two.

Another cause of a light band occurring along one edge of a plate is slight reduction by hypo in the presence of air. Perhaps some beginner has made the same blunder which I can recollect having made myself in the first year or so of having taken up photography. I recollect bringing back a batch of plates from a holiday, developing them carefully, and then, on removing them from the fixing bath, standing them in a grooved washing tank with about 1 inch of each plate above the surface. I remember my dismay at finding that the portion of each plate thus projecting had become reduced by several tones in comparison with that in the water. It was a silly blunder, for even if the plates had been well rinsed under the tap immediately on taking them out of the hypo they would probably have suffered no harm. But it must be remembered that hypo solution left in the film of a negative and the latter exposed to the air exerts a quite decided reducing action.

As regards dark bands across a plate, these again may arise from material of the shutter hinge, exerting a fogging instead of a desensitizing action upon the plate. This perhaps is the most likely cause of a band of fog on the plate apart from those arising from gross carelessness in, for example, withdrawing a slide from the camera with the shutter not completely thrust home.

Dark Outline Marks and Streamers

Following the more widespread use of tanks for development, a curious kind of marking is liable to occur in negatives. It takes the form (in the negative) of a dark line, which appears only where dark objects, such as a row of houses or masses of foliage, occur against a bright sky. This dark line roughly follows the outline of the dark part of the subject, producing an unsightly white-edging effect in the print. Briefly, the cause is stagnation of the developer during the period of development. The portion of the developer in contact with the sky part of the negative becomes exhausted, while that in contact with the dark part of the subject is but little reduced in energy, and, diffusing toward the sky portion of the plate, produces additional density along the line which forms the frontier between the two areas. Thus the effect is much more likely to occur in tank development, for the reasons, first, that usually a much weaker developer is employed and, secondly, there is more liability to leave plates to themselves in a tank than when a dish is used for development. The latter, of course, should not be the case, and a rule should be made in tank development to provide for the constant, or at any rate the frequent, movement of the solution. This is most conveniently done by having the develop-

ing tank water-tight and turning it first one way up and then the other every two or three minutes during the period of development.

Streamer markings have their origin in a similar cause. They arise chiefly in subjects where some dark object, such as a chimney or a telegraph pole, occurs. The developer over this area has comparatively little to do, with the result that, as the outcome of the vertical position of the plate, its effect passes by diffusion to the portion of the film immediately below it, the action running downward in "streamer" fashion. Here, again, the effect is altogether obviated by constant movement of the developer, while it is less liable to occur with developing solutions of full strength than with those considerably diluted with water.

Reticulation Markings

The curious markings which are occasionally produced by the use of the mercury-ammonia intensifier were, I see, the subject of a query from a reader last week. It is quite true that this intensifier seems particularly liable to produce this kind of marking; nevertheless, it has really nothing to do essentially with the use of either mercury or ammonia, but is the result of strain set up in the gelatin film. No doubt the great tanning action of solution of bichloride of mercury upon gelatin is a contributory cause to the production of this effect, but it is comparatively easy to get reticulation intentionally simply by subjecting a plate to a sharp and considerable difference of temperature. As was recently shown by Mr. Olaf Bloch, in a very interesting paper before the Royal Photographic Society, the removal of an ordinary unexposed but fixed plate from wash water at 60° to water at 90° F. will cause characteristic reticulation over the whole surface, probably no less intense than that which sometimes arises in the use of the mercury intensifier, since the apparent effect is magnified by the greater density of the intensified plate.

Dark Tangle Markings

Lastly, I may come to one very mysterious looking marking, the cause of which, however, is exceedingly simple. A tangle of narrow wavy dark bands, which sometimes may extend all over the plate, is caused by a pin-hole somewhere in the camera body, *e. g.*, in the bellows or in some part of the rigid or flexible walls of the camera. If the plate or film remains uncovered by a shutter and the camera be at the same time carried about in direct sunlight, the pin-hole actually forms a succession of images of the sun upon the sensitive surface, the successive movements of the camera causing these separate images to run into curved bands. The remedy, of course, is obvious.—*British Journal of Photography.*

Silver and Its Recovery

I AM taking for my text this month "The Criminal Waste of Silver." It is worth deep contemplation by all concerned in the industry,

especially at the present time, when economy is one of the chief aims in life and work.

It will be advisable to deal broadly with the subject of silver, since the phenomena connected with it and its photographic powers are remarkable and really unique.

Silver nitrate is a compound produced by dissolving the metal in nitric acid, which the engraver also calls *aqua fortis*. It is a translucent, very soluble, white salt, and is widely used to impregnate the gelatinous films of photographic plates. It is the starting point for the manufacture of all the other compounds and salts employed in the preparation of various materials—the chloride, bromide, iodide, etc.

The art of photography is based upon the peculiar and inexplicable fact that the silver salts just named darken on exposure to the light. I am not going to attempt to explain *why* this is so; because no one has yet succeeded in *proving* any theory in respect thereof. We must take the matter as it stands. Upon allowing a drop of the solution of silver nitrate to evaporate—preferably on glass—nominally the salt crystallizes in rhombic tables; but on the small scale all kinds of pretty formations occur, presumably owing to some interference beyond our discernment.

The reader knows that if a P.O.P. is laid in the light it gradually becomes violet, and then darkens with a brownish tinge. An interesting experiment can be made by cutting such a paper into small pieces, while still white, and placing them in a jar of water standing on a table near a window. Very soon the whole solution, and not only the paper will become colored, thereby establishing the excessive sensitiveness of the chloride to light.

Silver chloride—a very important darkening salt—cannot be prepared directly from the metal; but has to be derived from one of its solutions, such as silver nitrate. When any soluble chloride of other formation—for instance, either chloride of sodium, cadmium, ammonia, or zinc—is added to a solution of silver nitrate, a milky-white precipitate of silver chloride is instantly produced. A similar result occurs by combining hydrochloric acid with the silver nitrate solution. A chloride—whatever its nature—always consists of a compound of chlorine and a base such as soda, zinc, and so on. Upon bringing any chloride of a suitable character into contact with silver nitrate solution the silver attracts the chlorine and becomes silver chloride, the nitric acid being released to join up with the substance previously in association with the added chloride.

The same result is engendered by placing hydrochloric acid in silver nitrate solution; the chlorine combining with the silver to compose silver chloride.

I dare say that the reiteration of these names will prove somewhat tedious; but it cannot be avoided if understanding of the subject is to follow. Silver chloride is also called horn silver. To the naked eye it is filmy, flocculent, or powdery, (and as I have already said) milk-white; but when examined under the microscope with reflected light it appears pale brownish and resembles flakes of horn, this condition probably

being responsible for the name already given. It is a very insoluble substance, and on this fact depends the success of a chemical test, detailed elsewhere, which is often employed in industrial quarters.

If we have an exceedingly weak solution of silver nitrate and add the merest speck of any soluble chloride—say a crystal of table salt, which is sodium chloride—thereto, the insoluble milky whiteness will soon be strikingly produced. This test will reveal silver in a solution in which the proportion of metal to fluid is as one to a million.

Upon observing the formation of silver chloride through the microscope we find that it is never crystalline; but begins as a folded and wrinkled film which elongates into curling fibrous arrangements, among them being myriads of the tiniest specks possible. There is a continual modification of these details, until the whole of them amalgamate homogeneously together.

Silver *bromide* is made by adding any *soluble bromide* to a solution of silver nitrate. In like manner, silver *iodide* is made by adding any *soluble iodide* to a solution of silver nitrate.

It is curious that silver chloride, etc., will not darken in a vacuum to which light has access, even after several months' exposure. This fact proves that the atmospheric gases constitute a necessary medium through which the light can act. It seems that the light itself, apart from air, is inoperative.

In the article published in the March number, great stress is laid on the advisability of recovering the silver from used-up solutions. It does not matter what they are, provided they are compounds or salts of silver, the metal can be extracted therefrom by suitable means. People concerned with the matter do not sufficiently realize that although a substance looks like a lump of sugar, or a fine white powder, or a mere solution, it contains the actual precious metal disguised by chemical combination, and removable therefrom in all its lustrous freshness by simple processes.

It certainly does seem inexcusable to pour silver solutions into the drains, unless their quantity is very small and insignificant. In the engraving business the subject is worthy of fully consideration.

It was pointed out in the article named that a silver powder can be deposited from a cyanide solution of the metal by means of zinc or copper. But no clue was given to the beautiful microscopical side of the matter, so I propose to step in here with particulars. Quite similar results are procurable from silver nitrate solution, without the risk of the observer being poisoned by the gas cyanogen, as would be the case when closely examining cyanide solution.

You merely lay some solution of silver nitrate on a piece of glass, and then immerse in it a scrap of zinc or copper—wire will do. Magnify it meantime, and watch intently. *Instantly*, particles of actual silver are mysteriously removed, springing from the added metal in the form of ferny tufts. You see first the raw edge of the added metal, and immediately leaflets emerge, as it were, therefrom, and rapidly

"grow" to dense miniature bushes. This material is actual silver, and can be filtered off, washed, and melted into a single piece. The contents of each of the magnified illustrations were in original only 1-24th inch in diameter.—*Process Monthly*.

The Metronome in the Dark-room

THE metronome, used by students of music for beating any required measure at will, is an instrument which can be of such service to photographers that a note on its use may be of interest. In practical use the writer has found it to be superior even to specially constructed dark-room clocks, principally on account of its advantage of registering each second by a loud "tick," thus leaving the hands and eyes of the operator perfectly free for the work in progress, while the duration of exposure, development, etc., can be accurately counted. It may here be observed that for all photographic work the metronome indicator should be set at the figure 60, when seconds will be ticked with the necessary precision. To begin with, amateurs who go in for enlarging to any extent—and their name is legion—will admit that there are few negatives not calling for some form of shading during the time of exposure of the enlargement either to prevent a shadow from becoming too opaque or for some other modification. It is obviously impossible to keep the eye simultaneously on the clock or watch and on the shading operation, while it is not everyone who can, unaided, count seconds with accuracy. It is here that one of the chief uses of the metronome comes in, since it can be set to tick off seconds with certainty, thus leaving the hands free for the manipulation of the lens cap and the work of shading the print, the eyes being also freed from the clock to follow the progress of this operation. Moreover, the time of shading and the total time of exposure, once found, may be recorded on the margin of the negative for future reference. Again, should it be of importance to make a number of prints or enlargements from the same negative, and to secure results as uniform as possible, if the metronome is used during the time of exposure and development, not only is exactitude in exposure assured, but each print can be developed for the same length of time, with the effect of securing results of absolute uniformity, providing that the developer is not overworked. This will be found invaluable in postcard printing and the making of portrait enlargements from small negatives. For the development of autochrome or other color plates the advantages of the instrument are obvious, since, if development is done blindly for the full two and half minutes, the plate need not be exposed to the dark-room light for one moment of the time until the acid permanganate (in the case of autochromes) has been poured on and all is safe; while if the system of tentative development now recommended by Messrs.

Lumière is adopted, taking the time of first appearance of the image is greatly facilitated, as also are the subsequent operations.—*Amateur Photographer*.

PATENT NEWS

Under this heading it is proposed to include each month a list of all the U. S. Patents; and brief abstracts of the more important, and to include also such foreign patents as present special features.

Copies of any patent can be obtained from the Commissioner of Patents, Washington, D. C. Price, five cents each.

- M. P. Film. W. M. Grosvenor. 1226655.
- M. P. Apparatus. F. W. Hochstetter. 1227138.
- M. P. Device. M. Segel. 1227081.
- M. P. Apparatus. C. B. Rowntree. 1227075.
- Camera. A. D. Rochau. 1228051.
- Camera. T. Tamura. 1227692.
- Camera Device. A. A. Ruttan & C. E. Hutchings. 1227675.
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- X-ray Tube. E. W. Caldwell. 1227884.
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- Film Binder. J. L. Ritchie & G. L. Vaste. 1229139.
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- Printing Machine. T. E. Halldorson. 1228912.
- Paper and Transfer Process. F. W. Kent. 1228680.
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- Film Camera. O. Callaway & G. R. Helsley. 1229882.
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- M. P. Camera. J. A. Golden. 1230576.
- Camera Shutter. R. Matthews. 1230500.
- Camera Shutter. R. Matthews. 1230501.
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- Coloring M. P. Film. C. W. Mable. 1230744.
- M. P. Film Cleaner. H. M. Colbyson & A. S. Dworsky. 1230120.
- M. P. Device. H. E. Watson. 1230251.
- M. P. Device. H. S. Morton. 1230201.
- Film Controlling Device. A. S. Holwell. 1231360.

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By Alice Boughton, New York

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NOTES ON ARCHITECTURAL PHOTOGRAPHY

By HENRY C. DELERY

A BRANCH of architectural photography in which the photographer has ample opportunity to display his ability is the reproducing of monuments, statuary, and the like. As in this class of work one is not very much restricted as to space, a long-focus lens should be used, and a point of sight obtained at a sufficient height to give pleasing perspective.

For statuary or small monuments a point of sight at an ordinary distance will suffice; for statues on high pedestals the camera should be placed at a remote distance from the object. The surroundings should receive special notice, even more so than with the usual architectural subject, and everything that can excite interest in the picture brought into view. The background in particular must be suited to the subject—*e.g.*, white statuary, when photographed in the open air, should never have a clear sky as a background, while, on the other hand, bronzes and dark subjects require a background

which has a brighter hue. In fine, to properly photograph monuments and statuary we must give the subject all the care and study which the portrait photographer bestows on his sitter.

Experience shows that for this character of work the best results are obtained in cloudy weather, when the rays of the sun are partly obscured, or even in the shade. By making the exposure in subdued sunlight, not only is the modeling and rounding of the subject rendered a better, but greater softness and delicacy of detail are secured. If the subject be a piece of statuary, and we attempt to photograph it under the unobstructed rays of the sun, the shadows cast under the eyes, nose, and chin will be very harsh, and the delicate modelling of the picture will be lacking.

Another important branch of architectural work is the reproducing of structural details of buildings, and such other work as may be required for the actual execution of the building itself. A build-

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ing may have to be altered or repaired, and a photograph demanded to show the exact existing conditions.

In a case of this character it is best to reproduce the building on a scale, in order that the draughtsman may be able to obtain his proportions and dimensions to lay out his drawing.

A position is taken directly in front of the building and as far removed as is possible, in order to reduce the perspective to a minimum. A batten, say about two inches wide and ten feet long, having each foot-space marked in plain figures, is set on the wall of the building. This will serve as a future guide to the draughtsman when scaling the photograph, and will also be the means by which the photographer will establish his scale when focusing the picture. The camera is set up, and, by applying a draughtsman's scale on the ground-glass, after shifting the camera to its proper position, dimensions corresponding to those marked on the building will be obtained on the scale. In other words, if the foot-marks on the batten measure one-eighth of an inch on the ground-glass of the camera the photograph will then be on a scale of one-eighth inch to the foot.

This method is also commendable when photographing manufacturers' details, such as panels, ornaments, moldings, caps of columns, etc., which are sent out as samples. The principal feature in this class of work is to avoid all perspective, in order that the photographs may be scaled accurately.

Still another important task for the architectural photographer is making a record of an edifice as its construction progresses.

In this instance a truthful representation of the building is absolute, and still further steps must be taken to verify the truthfulness of the reproduction, as photographs of this nature may be used to settle contentions in the courts.

If the photographer is required to follow the history of the building from its conception to its completion, the first step should be to photograph the condition of the adjoining buildings, which, from various causes, may be in bad

condition, such as cracked or decayed masonry, walls out of perpendicular, and the like, and which, if not photographed previous to the demolishing of the building, may involve the owner or the architect in serious trouble. For a wall which is out of perpendicular the camera is set up with its swing-back absolutely plumb; on the building itself a plumb-line is dropped from the top of the wall and held free against the batten with foot dimensions marked on it; in this manner the distance from which the wall is out of perpendicular is plainly visible and cannot be disputed. It is also well for the photographer to have his notebook at hand and record all data which may be of importance.

When the time of erection begins a weekly photograph should be taken of the premises, and, if the building be a time contract, the date should be plainly marked on a sign which is included in the view. This will save considerable contention at a later date and make the photograph convincing in itself. For a high structure it is well to mark the number of the floor on the date sign. When the structure is finally completed the architect has a record of his building which may be of inestimable value for future reference.

Architectural drawings may have to be copied, and here the architectural photographer enters a new field. Perfect accuracy must again mark his work. We will first study the drawings. These are often made on rough-surface paper, and it is desirable when setting them up that the light should strike the paper from all directions, thereby doing away with shadows, and, to a great extent, preventing the rough grain of the paper from showing. As the designs and plans prepared by architects are drawn to a scale, it is well when reproducing them to see that the scale-unit is preserved, and, if possible, to reduce to some convenient scale generally employed by architects. If there be no scale marked on the plans a line should be drawn with inch-marks and foot-marks figured upon it, so that the draughtsman can, if necessary, decipher the drawings.

For general outdoor work on commercial buildings I have found the ordi-

nary unorthochromatic plate quite capable of giving good results, and for this work would recommend a fast plate which will enable us to photograph even non-actinic buildings instantaneously on crowded thoroughfares. Naturally the latitude in exposure is greatly reduced, but one soon accustoms himself to the speed of his plate, so that exposure soon becomes of secondary importance. Another advantage of the fast plate is that it permits of the use of a very small diaphragm—an item of considerable importance in architectural work, where a

great amount of detail and clearness is always required.

For a higher class of work where color and tone effects are desired, the orthochromatic plate is advised. The principal benefit derived from its use besides the true rendering of color luminosities, is a more brilliant negative with better detail and a clearer rendering of distance. For monuments and similar views, where the natural scenery or a sky silhouetted with clouds is intended to embellish the picture, an orthochromatic plate is indispensable.

ORTHOCHROMATIC PLATES AND LIGHT FILTERS

FOR all-round photographic work a complete color correction is generally regarded as impracticable. It necessitates the use of a deep color screen which prolongs the exposure considerably, and of red-sensitive plates which can only be handled in complete darkness or in a light that is very little removed therefrom. The consequence is that non-orthochromatic plates are still used for the many purposes for which they are quite suitable, though a great deal of amateur photography is done with orthochromatic emulsions. When we remember that practically all the roll film made is orthochromatic, and that orthochromatic plates of various brands enjoy a great popularity, there can be little doubt that, as far as the amateur is concerned, more exposures are made on color-sensitive plates and films than on those which do not possess that quality.

If such plates (and in what follows the word plates is used as including films) are exposed without a light filter of some kind, very little is gained. It would require an expert to pick out of a number of negatives those which had been taken on ordinary and those on orthochromatic; and even the expert might be puzzled or wrong. To understand this, it is necessary to consider the fault for which orthochromatism is a remedy.

The light to which our eyes are most sensitive is yellow and yellowish green; they are less sensitive to bright red and to blue, and much less so to deep red and to violet. Therefore, a patch of the most intense violet-blue that could be got, seen on a background of equally intense yellow, would form a contrast of a powerful character, the violet appearing dark on a bright ground.

As every photographer knows, this is not at all parallel with the result on an ordinary plate. To the yellow and yellowish green it is almost blind, to blue it is very sensitive, to violet also it is sensitive, and there are other rays, which the human eye cannot perceive at all, which affect the plate powerfully. These rays are called the "ultra-violet." To red light, also, the plate is insensitive, so that light of this color can be used to illuminate a dark-room. The expression "illuminate a dark-room" is not quite the bull it seems. A "dark-room" must be dark to the sensitive materials that are to be manipulated in it; provided this is so, it cannot be too light to the eyes.

Orthochromatic plates are coated with an emulsion which, by means of certain dyes, has been made more sensitive to green, yellow, and sometimes to red, than before. But although this is the case, these dyes are not able to give to the

emulsion the same sensitiveness as the eyes possess. It is still very much more sensitive to blue as compared with yellow; in fact, the difference is still so great that the advantage of the dyes is almost entirely hidden, as has been already mentioned. It is to remedy this state of things that a light filter or color screen is used.

The fact is sometimes overlooked that the photographer has a very useful color screen in the lens itself. Glass is comparatively opaque to the ultra-violet rays just referred to, so that they do not play so large a part in photography as they would do, for example, if our lenses were made of quartz, which is much more transparent to them. The atmosphere also absorbs a great deal of the ultra-violet light which reaches it from the sun.

In order to make the photograph show colored objects in the same strength of light and shade as the eye sees them, a plate must be used which is sensitive to light of all the colors to which the eye is sensitive; and we must also interpose in the path of the light a light filter which will absorb ultra-violet, violet, and blue rays to such an extent that the excess of sensitiveness to such light which is possessed by the orthochromatic plate is counterbalanced.

It might be supposed at first that all that need be done would be to adjust the light filter to the plate so that their combined action was to get exactly and always the same effect as is seen by the eyes. But while this is perfectly possible, and indeed work with such a combination is done daily, it is open to the objection that the plates can only be used in darkness, or almost darkness; while the light filter prolongs the exposure necessary to such an extent as to make hand camera work, except under the most favorable conditions, very difficult. So that, in ordinary everyday photography, it is usual to resort to a compromise.

Orthochromatic, or isochromatic, plates have their sensitiveness to green and yellow increased very much, but are still only slightly sensitive to red. With such materials, therefore, we can use a fairly bright red light in the dark-room, provided it is the right sort of red—that

is to say, a deep ruby and not an orange. Plates that are sensitive to red as well are called "panchromatic." We see, then, that the light filter used with orthochromatic plates is not one which makes the rendering absolutely accurate, but one which gives a perceptible improvement without causing too great an increase in the exposure.

The question we have to determine, therefore, is how far to carry the compromise, and it is evident that this will depend on the nature of the work to be done. The writer cannot refrain from putting on record his opinion that, for every photographer (except the mere beginner) where the prolongation of the exposure is not a serious matter, and other circumstances do not offer difficulties, the best result is to be obtained with a panchromatic plate and a color screen deep enough and of the right tint to make the correction complete: the compromise of the orthochromatic plate and not very deep light filter is only fully justifiable when there is a necessity for it. No one who has learned to use panchromatics for landscape work, for example, is ever likely to go back to other material.

Self-screen Plates

In the "self-screen" plate we have an orthochromatic emulsion which has been dyed so as to act to some extent as its own light filter. The consequence is, it is impossible to make such plates as rapid as the simpler orthochromatic plates, since any light filter to act at all must cut some of the light and, if it does that, must necessitate a longer exposure. If the light filter is in the emulsion, this is equivalent to making that emulsion slower. Self-screen plates are therefore not among the fastest, but the dyeing is not carried very far. Probably they are about half as fast as they would be did they not contain the screen dye, so that they are still quite fast enough for all ordinary purposes. They can be used in the hand camera, and generally for work for which the very utmost possible degree of sensitiveness is not an essential.

But a light filter which does not prolong the exposure more than twice, although better than nothing, is still very

far from giving as full a correction as we are often glad to have; and so it comes about that separate light filters, which can be put on the lens for use as required, are largely employed by photographers. They are not of any practical value with non-orthochromatic plates, as they increase the exposure to an inconvenient extent; but they can be used with advantage either with the ordinary kinds of orthochromatic plates or with self-screen plates.

It is customary to describe these light filters as "three times," "five times," and so on, according to the effect which they are supposed to have upon the exposure. We write "supposed to have" because the classification is only a very rough one; it may serve to indicate to which groups a filter belongs, but is not by any means a reliable guide for exposure.

When a light filter has been bought, one of the very first things which should be done is to find out what increased exposure it entails in ordinary circumstances; that is to say, with daylight during the greater part of the day. Toward evening when the light is more yellow, and by artificial light when it is very much more yellow, the exposure increase necessitated by the filter is very much less; so much so, as far as artificial light is concerned, that it is not usual to employ a filter with it at all; the light is yellow enough, that is to say, it is comparatively poor enough in blue or violet, not to require it.

Although the orthochromatic plates of different makers are not quite alike in their color sensitiveness, they resemble each other nearly enough for the same color screen to be used with them indiscriminately. If the photographer uses self-screen plates he will find that a color screen, which is, say, a five times screen with orthochromatic plates that do not embody any light filter, does not call for quite so great an increase as that. The difference, however, is a very slight one, and the actual increase should be found by trial.

It has been the writer's frequent experience that the increased exposure required is generally under-estimated by the maker or seller of the screen. Seven or eight times is the increase generally

entailed by a "five-times" screen, if full advantage is to be taken of it. It is a curious fact that if the negative is in the least under-exposed the screen does not seem to exercise its full effect.

The Most Useful Color Screens

For work with self-screen plates a five or even a ten times filter is the most useful, as giving the most complete correction. For general work, of course, the plates will be used without any other screen than that which has been incorporated with them, but when this is not sufficient, then, within reason, the deeper the screen that is used with them the better.

With those orthochromatic plates which are not provided with any screen in the emulsion itself, and with roll film, it will be found that a two- or three-times screen is often very helpful. It will enable the cloud forms to be got on a landscape negative with full printing value, and at the same time it does not make the exposure so long as to put hand camera work quite out of the question. It should be supplemented by one which calls for twice or three times as much increase, for work where correction is more important than keeping the exposure short.

Using Two Screens at Once

It has been suggested that when a deep screen is needed, one weak one may be superposed on another, or a weak and a strong one used together. There is generally nothing to be gained by this, since the strong filter cuts out what the weak one cuts out and something besides. That this is so can be seen by holding one partly over the other: the two screens together, if their color is the same, and they only differ in depth, will not appear appreciably denser than the deeper screen by itself.

So far from a "six times" and a "three times" screen requiring nine times the exposure when the two are used together, the writer found by actual trial that the two screens combined did not call for an exposure appreciably longer than was needed by the "six times" screen used by

itself. And if the exposure necessary is not longer, it is evident that the screen cannot be serving any useful purpose. On the other hand, the use of two separate filters, with the thick glasses of which they are composed, is likely to affect the definition prejudicially.

When we come to the use of panchromatic plates, the screens used are almost sure to belong to the "K" series made by Eastman. These are made in three depths, known respectively as K1, K2, and K3, and, although they are primarily designed for use with the panchromatic plates, they are quite suitable for orthochromatic plates of any kind. The K1 screen, used with an orthochromatic plate, may be regarded as about a "three times" screen, and the K2 a "ten times." With the panchromatic the K1 increases the exposure something less than twice, the K2 about four times, and the K3 about six times; but the actual figures of the increase required by each batch of emulsion are given in the box with the plates, so that accurate work can be done at once without any need for experimenting.

With these plates the K3 gives a rendering which is approximately correct, and therefore should be used whenever circumstances permit. The K2 is intermediate, and is suggested as being suitable for portraiture, where, to avoid the necessity for retouching, the color correction must be as complete as possible, though at the same time long exposures cannot usually be given. The booklet *Real Orthochromatism*, published by the Eastman Kodak Company, will be found to be a good supplement to this article, as it goes into the subject in a more ad-

vanced manner than can be done here, and contains much that is of interest on orthochromatic work, whether the reader is a user of the Wratten productions or not.

Over-correction Highly Improbable

It is sometimes said that the use of color screen is carried to the extent of over-correcting the rendering; but, except with experimental home-made screens, this is hardly likely. None of the commercial screens, unless deliberately made for that purpose, will over-correct; in fact, with the exception of the K3 and one or two special kinds, none of them correct fully. Photographers are so accustomed to an incorrect rendering of colors that they are apt to regard any approach to truth as an exaggeration, while the disappearance of color contrasts in a correct rendering may easily suggest that the orthochromatism has been overdone. It may be overdone from the point of view of the impression required, but it may none the less be a perfectly correct monochrome rendering of the subject.

Inasmuch as orthochromatic work on the whole must be better than non-orthochromatic, by eliminating a defect inherent in the ordinary emulsion, one cannot but wish to increase the number of photographers who follow it. The hope of doing a little toward this end has been the cause of this article being written, and if the writer has at times appeared to be teaching his photographic grandmothers to suck eggs, he asks these experts to forgive his presumption for the sake of the cause which he is advocating. —GEORGE BASSETT, in *Photography*.

THE CHOICE OF A LENS—"ANASTIGMAT"

SO many misstatements and foolish questions occur from time to time that the following notes are written in the hope of clearing up some of the, apparently, obscure points about this most essential part of a photographer's equipment. When the tyro applies to

a firm of manufacturers for a catalog, he gets such a lengthy list of lenses of various apertures and different constructions that he may well be puzzled.

There are three heads under which a lens may be considered: its focal length, its aperture, and its construction; and

these again are interrelated. The field of view is determined by the focal length on a given size of plate.

This plate size we will consider fixed. The first thing will then be to choose a focal length to include a given angle of view. If architecture and interiors will be the chief aim, a wide-angle lens is wanted—*i. e.*, a short-focus lens, three inches on a quarter-plate, and four-and-a-half inches on a half-plate. For ordinary work a five-and-a-half-inch lens gives most pleasing results on a quarter-plate, and an eight-inch on a half-plate. For portraiture a longer focus is desirable—seven or eleven inches respectively. It will be seen from the table that the angle of view diminishes as the focal length increases, and the smaller the angle of view the flatter the picture. Hence the reason for the above recommendations.

TABLE I.—ANGLE OF VIEW

Focal length, inches.	Size of plate, inches.	Angle of view, degrees.
7	$4\frac{1}{2} \times 3\frac{1}{4}$ quarter plate	40
$5\frac{1}{2}$	$4\frac{1}{4} \times 3\frac{1}{4}$ "	52
3	$4\frac{1}{4} \times 3\frac{1}{4}$ "	83
$4\frac{1}{2}$	$6\frac{1}{2} \times 4\frac{1}{4}$ half plate	82
8	$6\frac{1}{2} \times 4\frac{3}{4}$ "	53
11	$6\frac{1}{2} \times 4\frac{3}{4}$ "	40

When considering the aperture to choose, one must be governed by the extent of one's pocket a good deal, for the price of a lens increases as its rapidity, *ceteris paribus*. For architectural work large aperture is not a necessity, though it is a convenience for focussing. Indeed, large aperture is inconsistent with large angle; $f8$ is generally fast enough, though lenses are made as rapid as $f6.5$. For ordinary work $f6.5$ is rapid enough for snapshots in bright weather, though if short exposures are to be made all the year round, $f4.5$ is a desideratum. Indeed, press workers will do well to take an $f3.5$ lens, so as to be prepared for all conditions of weather. For the studio, also, a lens cannot be too fast. The only doubt that an amateur can have is, then, whether he should use an $f6.5$ or $f4.5$. Is the increased rapidity worth the extra expense?

We propose then to consider the advantages and disadvantages of an $f4.5$ lens. First of all, it has less depth of

focus than the $f6.5$, though by stopping down this can always be remedied. It must not be forgotten, however, that diffusion of the background is sometimes an advantage. Another drawback is the necessity for extra care in focussing the more rapid lens, a small movement of the focussing screen rapidly blurring out the image. Again, as I said above, aperture and field of view are opposed to one another; *i. e.*, the lens of larger aperture will not have the same covering power as the slower lens. The designer of the lens had, above all, to consider the question of aperture, and choose the forms of his lenses accordingly. Moreover, the large aperture demands very careful correction of aberrations, and this cannot be obtained over a very large field. It should not then be expected that the $f4.5$ lens will give good definition beyond the corners of the plate; per contra, the $f6.5$ lens should, and therefore allow for a reasonable rise of front. If, therefore, the rising front is much used, the $f6.5$ lens had better be chosen.

Again, with regard to illumination. Here the $f4.5$ scores. If one looks through a lens and turns it sideways, it will be seen that the aperture appears smaller and smaller, till it finally vanishes. This means that the illumination on the plate falls off as one proceeds from the center to the edges. Really the lens only works at its full aperture in the middle of the plate. The greater the circle of illumination of the lens, the more light there will be getting to the corners of the plate. Hence, the lens should cover at least one size larger plate than it is used for, *i. e.*, a quarter-plate lens should illuminate a half-plate, and so on.

TABLE II.—CHOICE OF LENS

Use of lens.	Aperture.	Angle covered with good definition, degrees.	Angle illuminated should be at least, degrees.	Focal length for quarter plate, inches.
Portraiture . .	$f3$ to $f4$	40	50	7
Focal-plane and snapshot . .	$f4.5$	50	60	$5\frac{1}{2}$
Universal . .	$f6.5$	60	80	$5\frac{1}{2}$
Wide-angle . .	$f6.5$ to $f8$	80	90	3

The inequality of illumination can be remedied by stopping down. The point to which it is necessary to stop down may be determined by removing the ground-glass screen, and finding what aperture of the iris can be completely seen all over the plate. It will be found that the smaller the illuminating power of the lens, the smaller must be the aperture to obtain equality of illumination. Hence, it will be seen if it is required to work with a given aperture and secure correct exposure all over the plate, the lens must be of considerably larger aperture.

The necessity of stopping down may be avoided to some extent by increasing the focal length of the lens, for this means a greater circle of illumination. This is another reason why it is desirable to have a long-focus lens for portrait work at a large aperture.

It is then not absurd, as some people think, to buy a lens of large aperture and work with it stopped down. In fact, the extreme aperture should only be regarded as a last resource attended with such disadvantages as vignetting, requiring greater accuracy in focusing, and giving less depth of focus. It must also be remembered that, however good a lens is, its definition is improved by stopping down. This may not be obvious to the eye, but can be readily seen on a negative containing fine detail if examined with a magnifier or in enlarging. It may be stated generally that the larger the aperture of the lens the less perfect the definition will be. A little in the way of crispness has to be sacrificed to obtain the extra speed.

There remains the consideration of the construction. Roughly, lenses may be divided into two classes, those consisting of three or more separated lenses and those of two more or less symmetrical cemented combinations of two to five lenses each. These latter, in the case of three or more lenses in each half are called "convertible," inasmuch as the single components can be used separately. Generally, this convertibility is of a makeshift type, the single lens being only

useful at small apertures. There are, however, some true convertibles—which are extremely expensive. The use of supplementary lenses with other types of anastigmats is also but a makeshift expedient for obtaining longer focus. Perhaps the following remarks will help in the choice of lens between these two types. They must be understood to be of a general character, and not to apply to every lens. The cemented type then has usually the advantage of a slightly larger field, and the disadvantage of poorer central definition. It is for this latter reason that it is not advantageous to make an $f4.5$ lens of the cemented type. For extreme rapidity the type of three separated lenses is the best. For wide angle, the cemented type. Some people also prefer the doublet type, because of freedom from flare, and of loss of light by reflection, because of the smaller number of glass air-surfaces. It must be remembered, however, that there need not necessarily be harmful flare about a lens with air spaces, and, further, that it may only contain two more glass air-surfaces than the doublet; and, lastly, the thickness of glass is very much less, and there is no cement, so that the absorption of light is less. The only way to settle between the rapidity of two lenses is to take photographs of a black-and-white object with each lens.

There is one further misconception with regard to the kind of lens for color photography that I wish to remove. It is supposed by some that for this kind of work a specially corrected lens is needed. This is true for three-color process work, and such lenses are made. But for single-negative work (autochrome, Paget, etc.), there is no need of a particularly good lens, because the screen places a limit to the definition of the picture. If the lens yields crisp definition, it will not be reproduced in the picture. Hence, ordinary lenses are quite suitable for this class of work, and one can choose a lens of largest possible aperture without fear of spoiling the picture.—*Amateur Photographer.*



BY MATTHEWS STUDIO
CONCORD, N. C.



"CHILDREN OF THE HILL DISTRICT"

BY JAMES N. DOOLITTLE

SAN FRANCISCO, CAL.

PITTSBURGH SALON, 1917





"FINAL"
BY JANE REECE
DAYTON, OHIO





THE CONNECTICUT RIVER
BY W. E. MACNAUGHTON
FROM A PLATINUM PRINT
"PICTORIAL PHOTOGRAPHY"





PRACTICAL PAPERS ON STUDIO WORK AND METHODS

A Chilly Reception

THE photographic reception-room is not, as a rule, an inspiring apartment. In the majority of examples there is a want of warmth or cheerfulness which places it rather below the standard of the lounge of a temperance hotel, which, as some may know, is depressing enough. We have the old-fashioned style with its dusty velvet appointments, the oak-panelled hall which suggests an office, and the modern drawing-room with its walls decorated in white and gray with carefully placed frames; but all seem to give one a chilly feeling even when one comes in from the rain. We believe this to be mainly due to the absolute lack of bright color in most of such rooms. Fearing that the proximity of bright color will injure the tones and values of his monochromes, the photographer brings everything down to a level of decorous dullness which is too often reflected in the face of the sitter. Flowers are now to be had cheaply all the year round, and will do much to brighten up a room, but too often white ones are chosen, and their cheering properties are, as we all know, very slight. The means used to raise the temperature should be of such a character that they will also raise the spirits, and for this reason a genuine coal fire, or even a good imitation of one but burning gas, is to be preferred to the dismal radiator, the closed-in anthracite stove, or the feeble glow of the electric radiator. The most striking reception-room which we ever entered was entirely fitted with real Oriental furniture, the few portraits which were visible being almost unnoticeable. On dull days, besides the necessary white lights, brass lamps with colored faceted glasses gave an air of comfort, which was added to by the crimson and orange which were the dominant tints of the luxurious divans which took the place of ordinary chairs and settees. Little of the walls was visible, Indian and Persian curtains and rugs adding to the air of luxury which was attained at a comparatively small cost. It is only fair to say that these fittings had taken the

owner, a clever artist in another direction as well as in photography, years to collect. It would be too much to expect an "Oriental warehouse" to produce such a result to order, but much might be done even on those lines. The effect on the visitor was that he had stumbled into a chapter of the "Arabian Nights," and, whether he understood fabrics, arms, or curios, he could not fail to be interested and pleased, and in a happy frame of mind he or she climbed the crazy stairs which led to the studio, where, clad in the loose blouse of the *ouvrier*, he met the artist, in spite of all his Oriental tastes.

During the winter colored transparencies, displayed in the darker corners of the room, will greatly add to its cheerful aspect, and will help to pass the time for those who may have to wait for a sitting. Naturally, Autochromes are to be preferred, but good hand-colored specimens either of portraits or landscapes are not to be despised. Perhaps we shall soon have the Kodachrome process available for this purpose. Fortunately nearly every studio has electric lighting installed, so that the illumination of a show of transparencies becomes a simple matter.

Not only upon the sitters, but upon the proprietor and his assistants, does a cosy environment react beneficially. We are quite certain that in such surroundings it would be easier to secure good orders than in the formal cold-toned apartments we so often enter. One note of caution must be sounded. Heaviness must be avoided at all costs. We have in mind one reception-room, warm enough in tone, which by dint of heavy, dull-red walls and hangings and subdued lighting was enough to make the visitor feel that the next development was his arraignment before a secret tribunal. Few photographers will perhaps care in these times to re-decorate altogether, but it is competent for everyone to look around and see what can be done to bring warmth and brightness into the reception-room.—*British Journal of Photography*.

Changes in Your Studio

HAVE you ever moved from one house to another? If you have, you will remember your surprise when you saw how faded and damaged the paint and paper were after the furniture and pictures had been taken out of the old house. And then you had a second surprise when you saw how shabby a good deal of your furniture looked in its new surroundings.

Three years or perhaps seven years before, everything had looked fresh and pleasing, but you, going in day after day, had never noticed the gradual change. If you had gone away for a year and then come back, you would have noticed the change which had taken place during your absence.

This change—this gradual fading and increasing shabbiness—goes on just as much in your business premises as it does in your private house. Unless you make the mental effort you cannot realize that it is taking place, but it is essential that you should realize it. And, what is more, that you should realize its effect on your business.

Remember that the majority of your customers are women and that women are much more influenced by trifles than men. Suppose that a mother brings her child to be photographed after an interval of a year. What would she see? In many studios it would be something like this:

The receptionist asks her to sit down. As she glances 'round the room she notices that everything is exactly as she saw it a year ago except that it is a year older. The signs of wear and tear are the only difference to be seen. There are the same framed specimens on the walls—she remembers noticing the old-fashioned frocks which dated the photographs as clearly to her as if the year had been printed below them. There is the same collection of small photographs—at least they are on the same table and she remembers the mounts which pleased her then but she does not see anything new to take their place.

And then when she goes into the studio everything is the same as she saw it a year before. Same backgrounds, same furniture, same camera, everything the same, in fact—except that they all show the year's wear and tear. Neither in the reception room nor in the studio has she seen anything that is new to her and that will excite her interest enough to take her mind away from the other things she has noticed.

But it may be said, she comes to have the child photographed and, if she gives an order, what harm is done even if the appearance of the place dissatisfies her?

How do you know that she is not thinking of having some photographs of herself and that something new and striking would not lead her to make an appointment? Or, when she is discussing the child's photographs with her friends, that she will not tell them what she thinks of

the studio? The work may be good but there are other studios where equally good work is done and where the customer who likes freshness and novelty has more chance of finding it.

Your studio is probably different. But—ask yourself this question: Suppose the child's mother came into your studio—what changes would she see?

Would she see any new specimens on the walls?

—any new styles, either in printing process or in mounts?

—any new way of showing your specimens?

—any new furniture or backgrounds?

If the questions can all be answered with a "No," now is the time for you to put matters right.—*Photo Digest*.

How to Keep Track of Your Work

A PHOTOGRAPHER uses a form of record which acts as a receipt, an advertisement to the customer, an office record and record for the purchasing department at the same time. The form is $8\frac{1}{2} \times 3\frac{1}{4}$ inches and is made up in triplicate. The first sheet is on white paper; this is retained in the office as an office record, where it is placed in a file under the date on which the work is to be finished, and afterward assembled in an alphabetical file under the customer's name.

The second copy—a yellow sheet—is the carbon copy which is given the customer and is returned by him when he calls for the pictures. When the pictures are delivered, the third sheet is pasted on the negative envelope so that this envelope shows at all times how many prints have been made from the enclosed plate.

The triplicate or third copy accompanies the negative. After proofs are shown this third copy is attached to the negative and passed on to the retoucher, the printer, through the finishing room, back to the office, and is held with the prints before delivery. On the back of this third form a space is ruled for entry showing the length of time the work stayed in each department. This tends to keep the negative moving, as the manager can tell at a glance just how much time was spent on retouching, printing and other operations.

In a small studio it is not necessary that the third or triplicate copy be used, as often the owner keeps in such close touch with the work that he knows where each negative is and how much work ought to be put in on it.

As indicated by the form, the ticket is self-explanatory. For pictures to be mailed, a check mark is made in the space over the word "MAIL." The date on which pictures are to be delivered is indicated either by checking or preferably by ringing the date on which delivery is to be made.

The yellow thicket is stamped "Paid" and returned to the customer, and this constitutes his receipt.



**The Photographers' Association of New England
1917 Convention is to be held at Infantry
Hall, Providence, R. I., September 25-28**

THIS convention is planned along practical lines. A few of the prominent features will be the operating demonstrations, making negatives under various conditions, using artificial light and daylight; finished prints will be shown at the convention. An effort will be made to give practical dark-room and printing-room demonstrations from the negatives made at the convention. There will be talks on studio system, reception-room work, and business side of studio. An expert artist background worker will give demonstrations. One of the foremost airbrush workers will demonstrate and tell the possibilities of the airbrush as applied to the studio. Another novel departure this year will be several meetings of small groups of members to talk over studio troubles and helps. We will hear short talks from the various photographers, some who are prominent and others who want to assist their brothers photographers by telling a bit of their own experience.

The prizes offered this year will consist of the handsome sterling silver cup. Another feature this year is departing from the former forms of certificates of merit. There will be no expense spared to obtain one of the most artistic in appearance which any photographer will feel proud to show in his reception room. One of these certificates will be presented to each who enters a display that passes a certain degree of excellency.

The pleasure part of the program will consist of an automobile trip in and around the beautiful city of Providence. A sail down the Providence river to Newport. After an inspection of this pretty spot a genuine Rhode Island clam-bake will be served, after which a trip will be taken around the harbor, then back to Providence. The banquet will be served as usual. Other attractions will appear, as the photographers and people of Providence are to welcome the Association with open arms.

The Annual London Salon of Photography

ALTHOUGH there is still some doubt as to the use of the British mail system for the import of photographs from foreign countries, we have

received announcement to the effect that the Salon will be held as usual this year and that the conditions of entry are practically the same as last year, *with the exception that it will be essential this year that all the pictures be sent unframed and unmounted and must be mailed in packages not exceeding seven pounds in weight.* Under these conditions photographs may be sent subject to censorship. Upon request we will be pleased to furnish entry blanks.

The package of prints and the letter containing data should be addressed to Hon. Secretary, London Salon of Photography, 5a. Pall Mall East, London, S. W.1.

The Least Amount of Light Visible

JUST at what point light becomes invisible is only of theoretical interest to the photographer, whose dark-room is but comparatively dark, i. e., it is many times darker than his reception room, and still many more times darker than his studio, but it is never dark in the sense that it is destitute of light. Some interesting experiments have been carried out at the Research Laboratory at Kodak Park in an endeavor to establish the minimum radiation, or least amount of light that can be seen by the eye.

The dark-room in which the experiments were carried out had to be made absolutely dark, and this means considerably darker than ordinary dark-rooms. The room in question has double walls and doors, the inner door being bound with rubber compression strips; all pipes, light cables, and air-shafts leading into the room being carefully fitted and plugged around the edges. The air, at a comfortable temperature, is forced from the basement of the Laboratory through light-trapped conduits. A room when thus sealed is absolutely dark.

The instrument for measuring the visible light is a visual sensitometer with an absorbing wedge to control the intensity of the light, and a light-proof lamp-house fitted with neutral filters, so that the only light visible is passed through a controlled aperture. A finely divided scale mounted on the wedge enables the observer to know the exact amount of light passing at any time.

The observer used a head-rest for all observations, so that the distance, position of the

eye, etc., would be as nearly constant as possible. In the first part of the experiment a dot of light about one-twenty-fifth of an inch in diameter was viewed at a distance of ten feet. Readings were also taken at distances of six feet and of fourteen inches. Results taken under the same conditions vary considerably from day to day.

When making observations with this apparatus all adjustments were made and the observer then remained in total darkness for at least fifteen minutes, so that his eyes might become adapted to the darkness before taking any results. The dot of light was then exposed at a brightness making it easily discernable, and slowly dimmed by moving the wedge across the aperture cutting down the light until it could just be seen, and the position of the wedge recorded on the scale. The wedge was then set so that the light could not be seen, and then moved slowly until it became just visible, and the position recorded. This procedure is repeated several times, and the average of the several readings taken is the "threshold" or least amount of light that can be seen for that series.

These experiments were repeated many times by several observers and a great number of readings taken, averages were then arrived at, and from the figures obtained much interesting and useful information is placed at the disposal of the scientific investigator. To the photographer who is interested in light it is interesting to know just what is the least amount of light that can be seen. It is so very small that it is difficult to express it in any but exact scientific terms. If, however, we increase the speck of light from one-twenty-fifth of an inch to the size of a small practical light source, such as an ordinary candle, then we would need a dark-room twenty miles long, because under similar conditions an observer would have to back away twenty miles from the lighted candle before the faintest trace of its light would be just barely visible.

Information Concerning the Making and Distribution of Pictures that Show the Activities of the Army and Navy

Permits to Make Unofficial Photographs and Drawings

Applications for permits to make pictures showing the activities of the Army, the Navy, and other departments and bureaus of the Government, if addressed to the Committee on Public Information, will be referred directly to the proper authorities, and unnecessary delays in securing proper consideration of such requests will be thereby avoided. It is the function of this Committee to secure access for the photographers whenever possible to the Government departments and to cooperate with them in making a pictorial record of the work that is being done. This task will be facilitated if all requests for permits are handled through one central authoritative office.

Special permits will be issued on occasions on

condition that all photographs and drawings be submitted for approval to the Committee on Public Information, unless otherwise specified. Requests for permits should explain the character of the pictures desired and the uses for which they are intended, and should be accompanied by sufficient references to establish the character and responsibility of the person or organization from which the request comes.

Pictures that are not Admissible

Pursuant to instructions emanating from the War Department and from the Navy Department, pictures of the following subjects should not be made or circulated without special permission in writing:

1. Army fortifications, magazines, wireless plants, navy yards, manufactories of munitions or any military equipment that has been installed or adopted since the outbreak of the war, as well as pictures that give information concerning ports of embarkation of troops or the fixed land defenses of the United States or the number, nature, or position of their guns.

2. Close views of the details of construction, as well as of all tests, or new weapons, equipment, or instruments used by the Army or Navy, such as—

- Aeroplane devices.
- Gun-handling gear.
- Electric communications.
- Stabilizers.
- Submarine fixtures.
- Sighting mechanisms.
- Range-finding instruments.
- Fire controls.
- Turret interiors.

- New inventions and experiments of military or naval import.

3. Movements of troops marching or in transport in such a way as to identify localities, or pictures that reveal special duties of detachments, positions of guards or sentinels, or that show new military formations.

4. Locations of mine fields or the location, identity, or number of warships belonging to our own Navy or to the navy of any country at war with Germany.

5. Views, in either news or fiction films, that tend to misrepresent or to arouse prejudice against friendly nations.

6. Scenes abroad that have not been passed by censors of friendly nations.

Whether or not specifically prohibited by these rulings, when pictures are plainly of a character that require official consideration, representatives of motion-picture companies and distributing agencies, exhibitors, illustrative news bureaus, editors, and others are themselves expected to withhold publication. When there is doubt as to the admissibility of pictures, communication should be had immediately with the Committee on Public Information, which, with the least delay possible, will pass upon them.

Information not permissible in news matter should not be used in reading matter, titles, or captions in connection with photographs, motion pictures, or illustrations.

Exclusive Privileges to Make Pictures

No exclusive privileges to make pictures for private commercial purposes will be granted to any photographer or artist.

Releases on Unofficial Pictures

Three prints from all photographic plates and films exposed with permission by other than the official photographers within territory controlled by the Army and Navy should be submitted for approval to the Committee on Public Information *before publication*. One print will be retained as a record by the department from which the permit is issued; one print will be retained by the Committee on Public Information; and the third print (if the picture is declared suitable for public distribution) will be returned to the owner, bearing the imprint, "Passed by the Committee on Public Information, Washington." The publication, sale, or other distribution of such pictures as are officially disapproved is forbidden.

Photographs made on permits issued by other departments and bureaus should be submitted for approval before publication. Still photographs should be submitted in duplicate; one print, if approved, will be stamped, "Passed by the Committee on Public Information, Washington," and will be returned to the owner; the duplicate print will be kept for the files.

One positive print of all motion picture films taken by special permits should be delivered, free of charge, to the files of the department from which the permit is issued.

Releases on Official Still Photographs

All photographs made by official photographers are developed and printed by the military and naval authorities in accordance with the regulations that are provided. All official plates and films remain in the possession of the military and naval authorities, and are not permitted to pass into other hands. Prints of every official plate or film that is released will be kept on file by the Committee on Public Information for record; additional prints may be furnished by the Committee as may be required.

Official photographs of the Army and Navy will be released through the Committee on Public Information. All official photographs bear the imprint of the Committee on Public Information, Washington.

Prices of Official Still Photographs

A uniform price of two dollars each is charged for the rights to publish official photographs. This price includes one unmounted print, for reproduction. Additional prints may be secured at a price that shall be determined, but which will approximate cost price plus a net charge of two cents each.

No photographic or other copies for reproduction purposes may be made from official prints, and only those prints may be published that bear the official stamp of the Committee on Public Information. The purchaser of official photographs secures the pictures for his own use only or for the use of the organization which he represents, and he may not sell, loan, or otherwise

dispose of the prints without the written permission of the Committee on Public Information.

Exclusive Rights to Official Still Photographs

No exclusive rights shall be given to any person or organization to the use of any official still photographs.

Releases on Official Motion-picture Films

Official Army and Navy motion-picture films will be released through the Committee on Public Information, and will be distributed as the demands of the occasion may warrant.

Official motion-picture films produced by other departments and bureaus may be secured at terms or under conditions that will be furnished upon application.

Photographers with the Army and Navy on Active Service

No photographers shall be permitted to accompany the Army abroad on active service in the war zones, except the official photographers in the Government service. Applications for permits for photographers and artists to picture the activities of the Navy should be addressed to the Committee on Public Information.

"Official Photographs" and "Official Photographers"

Only those photographs that are made by official photographers in the employ of or under contract to the Government may be termed "official photographs." Only photographers who are in the employ of the Government may be designated as "official photographers," and this designation will apply only during the period of their service.

Photographs Submitted for Approval

Motion-picture producers, illustrative news bureaus, and photographers generally are invited to avail themselves of the advice of the Committee on Public Information in regard to the admissibility of pictures that are taken without permits. In such cases photographic prints should be submitted in duplicate to the Committee on Public Information. If admissible one print will be marked, "Passed by the Committee on Public Information, Washington," and returned to the owner without further comment. If the picture is not admissible, the print will be marked, "Not authorized by the Committee on Public Information," Washington. The use of photographs thus disapproved is prohibited. The duplicate print will be retained as a record by the Committee on Public Information.

Motion-picture films will receive immediate consideration, and will be returned with the written approval of the Committee or with suggestions concerning changes that may be desirable.

No photographs or drawings shall be considered as approved until prints have been submitted for review and have been officially stamped or released in writing.

KENDALL BANNING,
Director of the Division of Pictures.

Business for the Photographer

MANY photographers are seeking new fields of employment owing to the small margin of profit on their work. Yet a photographer in one of our larger cities, where there was considerable competition, seemed to keep very busy, while his automobile testified as to his prosperity.

Asked how he did he replied, "Advertising!" Everybody wants their pictures taken," he said, "but they don't just get around to it. Now that is how I make my money, I see to it that they do get around to it." Which he did.

One of his stunts was to mail to a well-picked list of townspeople a blank photograph mount. In the picture circle he inserted his advertisement, together with the pertinent remark: "You ought to have your picture here."

He also kept a card index of all his appointments. If his records showed that certain persons hadn't visited his studio for two years since their last "family group picture," he wrote them a pleasant letter suggesting that they come again and have a later grouping. He met the customers himself and attended to all the picture-taking, but he found it profitable to hire help to do the developing, which left him free to work up his advertising.

The Wanamaker Third Popular Exhibition of Photographs

THE Third Popular Exhibition of Photographs will be held in the John Wanamaker Store, Philadelphia, November 1 to 17, 1917. Entries close October 13, 1917.

The first prize will be \$25 in cash.

The second prize will be \$15 in cash.

The third prize will be \$10 in cash.

And ten prizes of \$3 each, besides honorable mention for as many pictures as the judges find worthy.

Rules for Exhibitors

To win a prize, a picture must be the original camera work of the exhibitor—not copied. The developing, printing or enlarging may be done by others.

Previous showing of pictures in other exhibitions will not exclude their entry, but pictures not previously exhibited will be preferred in awarding prizes. Successful contestants, however, in any of our more advanced March Exhibitions, are not eligible for any of the prizes.

Only one of the first three prizes will be given to any one exhibitor.

Pictures winning prizes become the property of the John Wanamaker Store, with the privilege of reproduction for illustration. Exhibitors who prefer to keep their winning pictures may do so by waiving claim to the money prize.

Photographs must be mounted on white, cream, light gray, or light brown cards, none smaller than 8 x 10 inches, or larger than 18 x 22 inches. We are obliged to insist on this rule to preserve the appearance of the wall. They must not be framed, and should have plainly written on the back the title of the picture, name and address of exhibitor, and other statements of interest mentioned on the label which our

Exhibition Bureau furnishes. In addition to the label, the exhibitor must make a list of his pictures on a card suitable for a card-index catalogue. These cards will be furnished on application.

Photographs intended for exhibition should be carefully wrapped and plainly addressed, and marked with name and address of the exhibitor; and delivered to the Exhibition Bureau on or before October 13, 1917. No picture shall be removed from the walls until the close of the exhibition.

The express charges, if any, must be paid by the exhibitor.

This November Exhibition is intended for novices in the art of photography, and the prizes will be awarded by newspaper photographers who are practical men. To keep up the standard of the exhibition, these judges will have authority to hang only the best pictures.

For further information, inquire at the Photographic Exhibition Bureau, Street Floor, Juniper, John Wanamaker, Philadelphia.

An Open Letter

East Canaan, Conn.,
July 18, 1917.

MY DEAR MR. HAMMOND:

In your very interesting article in the July number of THE PHOTOGRAPHIC JOURNAL OF AMERICA, "Variations in Iron-Silver Printing," you say, on page 293, *en passant*, "Do not dissolve ferric oxalate in hot water."

Please do not think that I am trying to find fault with your valuable contribution to photographic literature, but I feel that there must be a mistake somewhere, and I should be glad to have the matter cleared up. I have done a good deal of sensitizing paper with platinum salts, using the method outlined in your article (*i. e.*, sensitizing with solutions of ferric oxalate and potassium chloroplatinite, and developing in a solution of potassium oxalate), and have invariably dissolved the iron salt in hot water, at about 212° F., nor have I ever had any failures which were not directly attributable to other causes. Also, I have instructed my pupils to use hot water in making up the solution in question, nor have I ever known of any failures which could even remotely be referred to such technic.

I should be glad to have this discrepancy explained, and I think the explanation might be valuable to other workers, since I have found the salt in question not readily soluble in cold water. This thought is what impels me to address you in the form of an open letter, but I wish to repeat that I am in no sense criticizing your article, and am merely asking for information.

Yours most sincerely,
PAUL L. ANDERSON.

Death of Henry S. Smith

Henry S. Smith, of the firm of Pinkham & Smith Company, Boston, and one of the best-known photographic lens-grinders in the country, died on June 28th at his home, Everett, Mass., aged fifty years.

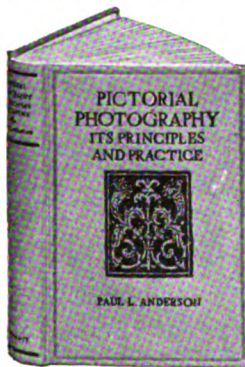
"Pictorial Photography, Its Principles and Practice"

BY PAUL L. ANDERSON.

Octavo. Cloth, illustrated, \$2.50 net.

IN response to an urgent demand for an authoritative book on American Photography written from a scientific standpoint, not too elementary on the one hand, nor ultratechnical on the other, Mr. Anderson has produced his "Pictorial Photography."

The effort has been made to present a discussion of the general principles of the various methods which will be found most useful to the person who wishes to express artistic impulses by means of the camera, but there is no complete discussion given of all the photographic methods which will be of value to such a worker and no reference is made to the many technical methods employed in commercial work.



Rarely, however, do we find an author who combines a pictorial appreciation and such a clear grasp of scientific principles upon which the fundamental success of all worthwhile photography depends. Mr. Anderson fully realizes the importance of a thorough understanding of the underlying principles, the part they play in enabling the worker to locate and correct his mistakes, and with this knowledge continually to develop and grow in his desire for photographic expression.

This hand-book is practical, well illustrated with text diagrams and full page inserts of some of the best examples of American photography printed on different media. There is inspiration and stimulus for better work all through its 302 pages.

Every photographer who wants to do better work will find discussed the very points on which he gets helpful suggestions and definite instructions. Supplied through this office.

Death of E. Starr Sanford

E. Starr Sanford, formerly of the firm of Davis & Sanford, Fifth Avenue, New York, and lately conducting a studio at Greenwich, Conn., died at Katonah, N. Y., on July 18th, aged

fifty-five years. About three years ago, while on his way to see his son in Texas, the ship upon which he was traveling was struck by lightning, and he received a severe shock, from which he never recovered. The arteries of his eyes became affected and later complications of a more serious nature set in, causing his death.

Side Lines

THE problem of side lines is a very difficult one to solve for the photographer, and the experiences of those who have had a fondness for trying them have been a series of successes and failures. We do not know of any golden rule that will enable any one to make an infallible decision as to what will prove a profitable side line or what will prove unprofitable, but, after many years' experience and many attempts, we feel that the safest rule is a simple one: The only side lines that prove profitable are those most closely allied to the main business.

It is out theory, built on experience, that the best results can be obtained only by the proprietor giving his undivided attention to his main business. So long as he keeps his attention and his thought centered on that, he is going to make it go, and anything that distracts his attention from it is going to interfere with his success. If a photographer studies his business and works hard at it he will see it increase. But if he pushes something else, his photographic business will begin to suffer.

So long as his side lines are so closely connected with his regular line that when he pushes one he pushes the other, he is making progress but if he branches out into a line that is entirely different he may make some money on the side line, but he is very liable to lose an equal amount, if not more, from his regular trade, and the result will prove that the venture has not really been profitable, although the figures may show a profit on the side line. The temptation to get more customers into the house, to make some "extra" profit from outsiders, is a hard one to resist, and many of us have fallen. Sometimes it has simply resulted in a loss on the investment; but the saddest cases are where the regular business has been neglected, and for every dollar made on the side line ten dollars have been lost on the business.

Every fellow to his own trade, and the fellow who gives his own trade the best of his time and attention will be the one who will excel. When the photographer is tempted to take on a side line in order to make an extra profit, let him first consider the probabilities from both sides, his own going business and the profit from the outside investment. In general terms, we would say that side lines that are kindred to the trade are very good, and in the majority of cases safe; side lines that are distinctly apart from the regular business had better be left alone, for they are unsafe and in the majority of cases will prove a loss.—*Trade News*.



THE WORKROOM

By the Head Operator



FLASHLIGHT POWDERS

WHEN DOES A FIXING BATH BECOME EXHAUSTED
DAMP-PROOF BOXES FOR NEGATIVES
GELATINOBROMIDE FERROTYPED PHOTOGRAPHIC PLATES
BLISTERS ON BROMIDE PRINTS
PREPARING TRANSPARENCY PLATES BY THE ALBUMEN
PROCESS
MULTIPLE TONING OF BROMIDE PRINTS
PHOTOGRAPHIC VALUE OF A WET DAY
SOME LANTERN-SLIDE METHODS
TWO PICTURES ON ONE PLATE
THE ADAPTER BACK
RACK FOR HOLDING RETOUCHING COLORS
PERMANGANATE BLEACH FOR BROMIDES

AMIDOL DEVELOPER

ROLLABLE BACKGROUNDS
THE SURFACE FOR TRIMMING PRINTS
LOCAL REDUCTION OF NEGATIVES
FOCUSING SHARPLY
FIXING AND WASHING
A HINT ON BROMIDE PRINTING
LARGE HEADS DIRECT
CLEANING, RENOVATING AND RE-MOUNTING PHOTO-
GRAPHS
AVOIDING AN OLD TROUBLE
REFLEX CAMERAS IN PROFESSIONAL WORK
POINTERS
HANDS

Flashlight Powders

THE making of flashlight powders must always be carried out with care. Each ingredient must be ground in a mortar separately, and mixed quickly with a spatula made of smooth white pine; hard rubber, celluloid, or metal must be avoided.

The following flashlight powders are not of an explosive character; they are not of an extremely rapid character, but quick enough for ordinary work, and may be depended upon.

Any formula giving sulphide of antimony or an ingredient should be avoided. Such a preparation, when mixed with chlorate of potash, sulphur, and magnesium powder, is equivalent to black gunpowder in explosiveness.

The following formulæ may be used with pyroxylin as a fuse with safety.

Potassium Permanganate Flash Powder

Magnesium powder	2½ oz.
Potassium permanganate in fine powder	½ oz.

Chrome Alum Flash Powder

Magnesium powder	1 oz.
Chrome alum, finely powdered and very dry	½ oz.

Potassium Nitrate Flash Powder

Finely ground potassium nitrate	1 oz.
Magnesium powder	1 oz.

Potassium Chlorate Flash Powder

Magnesium powder	1 oz.
Finely ground potassium chlorate	½ oz.

Aluminum Flash Powder

Finely ground aluminum	¼ oz.
Magnesium powder	3¼ oz.
Potassium chlorate	½ oz.

The following formula for dark interiors, mines, etc., has been used successfully:

(384)

Powdered magnesium	5 oz.
Nitrate of baryta	6 oz.
Potassium chlorate	1½ oz.
Flowers of sulphur	1 oz.

Melt beef suet, use 3 ounces in an earthen pipkin, add the magnesium, then the nitrate of baryta, chlorate of potash, and last of all the sulphur. Carry out the melting over a water bath, stir with a pine stick, and pour the mass into a cylindrical zinc box, in the center of which has been fitted a piece of lamp-wick, soaked in a mixture of chlorate of potash and water and well dried. This will form the torch for lighting the mixture at any time. The zinc box will burn with the mixture and aid the light.

The following preparation is perfectly safe, but burns slowly, giving a very brilliant light. The use of powdered shellac is introduced for this purpose. The mixture may be used in shallow tin cases, or a low formed earthen pot, such as is used for pomades and face creams:

Shows Very Brilliant Light

Powdered shellac	2 oz.
Nitrate of baryta	½ oz.
Potassium chlorate	1 oz.
Powdered magnesium	2 oz.

A thin wood chip placed in the center will form a wick for igniting. The above preparation should not be mixed for a long time before use—a day or two will suffice—and no harm will accrue from moisture if kept in a dry place.

When Does a Negative Fixing Bath Become Exhausted

THAT very necessary preparation for the photographer's use known as the fixing bath receives probably less attention than anything else that is employed in photography. All the while an exposed plate can be cleared, as it is more frequently termed, the negative fixing bath is worked to the limit, or until it is noticed that a number of pinholes show themselves, or more

frequently when the negative is removed from the fixing bath it is observed to present a decided opalescent bloom all over the surface. When this is observed it may at once be taken for granted that the fixing power of the solution has become exhausted. This bloom is due to the presence of hyposulphite of silver in a concentrated form, together with an extremely fine deposit of sulphur, all of which may be freed from the plate by placing it into a freshly made chrome-alum-hypo fixing bath. If a plain hyposulphite of soda fixing solution is used the liquid soon becomes discolored, especially if the developing agent is pyrogallie acid, which becomes oxydized, thus producing the brown stain mentioned, a stain that will remain permanent if the plate is washed, dried, and exposed to sunlight in the process of printing. In a case of this kind the best method of clearing the film of the pyro stain, either before the final washing, or, if washed before printing, is to place it into a tray containing the following preparation, which will clear the film and harden it at the same time. After this treatment the plate must be wiped with a tuft of wetted absorbent cotton, while a stream of water is flowing over it from the faucet.

Clearing a Stained Negative Film

Common alum	1 oz. av.
Water	6 fl. oz.
Citric acid	$\frac{1}{2}$ oz. av.

As soon as the salts are dissolved, the solution will be ready for use, or the following clearing liquid may be used, as it acts with more vigor:

Saturated solution of alum	10 fl. oz.
Hydrochloric acid	$\frac{1}{2}$ fl. oz.

Either of these clearing solutions may be depended upon to act thoroughly and effectively in clearing any stain produced by the developer.

When a negative fixing bath has reached the stage mentioned and becomes saturated with the silver haloids it should not be thrown away, because it is richer in silver by far than any of the paper-fixing solutions. Every time a negative fixing bath becomes exhausted, pour the contents into a large stoneware crock, together with the disused fixing solutions that have been employed for paper prints, so that the metallic silver may be thrown down or precipitated by means of a few pounds of sheet scrap zinc, stirring the mass occasionally with a stick so as to shake off the precipitate. This method is to be preferred to the use of liver of sulphur (potassium sulphide). All the silver is precipitated by this means in a more cleanly way than by the sulphur method, as well as being more healthy. Sulphur fumes of any kind should be kept away from the dark-room or workroom if for no other purpose than to prevent the injury that will always occur to both plates and paper, by the sulphurizing of the sensitive surface.

Another point should be attended to, soon after a new fixing bath has been in operation, and that is to filter it, wash out the negative fixing box, replace the filtered bath, and then examine the negatives that have been fixed in it. They will present an appearance that will give pleasure to view them; there will be no pinholes, no bloom upon the film, or nerve-like

markings upon the surface. Every negative will present a clean and clear appearance, and because of the entire freedom from surface markings there will be less labor for the retoucher and less money to be paid by the proprietor, owing to the work of retouching being reduced to a minimum. Those photographers who have never made this trial should do so, and when they see the result in their negatives they will never begrudge the time and the small amount of labor expended to secure such good results.

Damp-proof Boxes for Negatives

THE ideal method of storing negatives has probably yet to be evolved. Meanwhile most of us, I fancy, drift into the habit of using the cardboard boxes in which the plates are originally packed. These are very handy, and in most ways admirable for the purpose, but, like other good things, they have their drawbacks. First, they absorb moisture from the atmosphere very freely, and unless stored in an extremely dry place the boxes soon get damp and mildewed, as the many who have to depend upon scullery, bathroom, or cellar for their storage can testify. Even more favored spots are by no means free from the bugbear, which if allowed to persist will in time reach the films of the negatives, and cause ineradicable damage. Second (a most persistent and annoying propensity), the surface of the cardboard inside the boxes rubs off in small pieces, making a kind of dust which gets on to the films and has to be removed every time the negatives are used. Third, the boxes are not quite so stiff as one would like them to be.

To remedy these failings I have adopted the following simple method. This has proved very efficient in practice, and as it can be carried out at a minimum of cost and labor, it will probably appeal to many readers.

The main stock-in-trade consists of paraffin wax and a small brush—the familiar gum-brush will do nicely. A quarter of a pound of the wax (cost three-halfpence at any oil and color shop) will do for about a score of quarter-plate boxes, which is about as many as most amateurs will require in a twelve-month.

The wax must be applied hot, and the boxes should be warm at the time of application. If these things are attended to, the fluid wax will be absorbed into the cardboard without leaving any appreciable deposit on the surface. Otherwise the wax will harden on the face of the cardboard, and cause trouble later by wearing or chipping off when the negatives rub against it.

A good way of carrying out the operation is to start by putting the boxes to warm inside the fender while the wax is being prepared. The latter, bought in a thick cake, easily cuts with a knife. The pieces may be placed in any old tin, which in turn is stood in a pan of water over the fire. Let the water come to the boil, and keep it there. The wax melts in a minute or two, and is then ready for application with the brush. This should be done as near the fire as feasible in order to keep everything as warm as possible throughout. The absorption of the wax takes but a few seconds, and the two halves of a box can easily be waxed in about a minute, while the whole business for a score of boxes

including preparation and clearing away, can easily be got through inside an hour.

The cardboard is surface-dry as soon as removed from the front of the fire, and the wax is thoroughly set in a minute or two. It will then be found that the boxes are as perfect in shape as originally, and that they are almost as firm as wooden boxes of the same thickness, with the advantage of being much tougher.

The wax undoubtedly makes the boxes damp-proof, and it also fixes the loose surface of the cardboard, thus doing away with the dust nuisance.

The latter observation implies that the wax has been applied to the insides of the boxes, as in my own case. I decided that an additional application outside was unnecessary, as the wax easily soaks right through the cardboard if a fairly liberal dose is given. Perhaps best of all, especially if many boxes are required at once, would be to melt a sufficient quantity of wax, and then simply dip the boxes in it for a second or so.

With common precautions there is no danger in applying the wax in front of the fire—certainly no more than with ordinary glue-pot operations—and the finished boxes seem to be, if anything, less inflammable than they are in the unwaxed state.

It may be advisable to propitiate the female section of the household by protecting the fender from any possible drops, but the process is not messy at all, and no anxiety need be felt in this direction.

Further uses for the waxing process, photographic and otherwise, will doubtless suggest themselves to readers, for it is obviously suitable for many purposes besides the one specially suggested above.—*Amateur Photographer*.

Gelatinobromide Ferrotypes Photographic Plates

THE collodion photographic negative possesses the peculiar property of appearing as a positive when viewed by reflected light with the plate backed by a black surface. The best-known application of this positive process is embodied in the so-called "tintypes" in vogue some years ago. These tintypes were produced by supporting the sensitized collodion film upon a thin sheet-iron plate coated with black japan varnish. The black surface showing through the transparent parts of the film produces the shadows, while the light-colored but opaque silver particles form the high-lights.

The inconveniences of the wet collodion process are well-known, and, although dry collodion plates of satisfactory keeping quality have been made, adequate sensitiveness to meet modern requirements has not been secured. The first gelatin ferrotypes failed to give a sufficient light-colored deposit for the proper rendering of the high-lights, and bleaching with bichloride of mercury was employed with a considerable degree of success. The lack of permanency of the bichloride bleach, however, proved a serious obstacle to this expedient. By means of special emulsions, Messrs. Lumière have succeeded in producing gelatin ferrotypes of sufficient speed that yield images comparable in brilliancy

to collodion plates and require no other treatment than developing and fixing. It has also been found possible to simplify manipulation by combining the developing and fixing bath. It is suggested that such plates may prove of value in radiographic field operations.—*Revue Scientifique*.

Blisters on Bromide Prints: Causes and Cures

A NUMBER of cases of blisters on bromide prints and enlargements have been brought to our notice lately, with queries as to cause and cure. Contributing causes are many in number. For example: (1) Kinks, cracks, creases, folds, etc., in the paper. (2) Handling the print with hot finger tips. (3) Sudden change of temperature; *e. g.*, putting the print into tepid water after it has been in icy cold water, or vice versa. (4) Change of density of baths; *e. g.*, passing a print from a strong (dense) hypo fixing bath straight into plain washing water. (Note, dissolving hypo in water lowers the temperature from ten to twenty degrees. Therefore tepid-water should be used for making up a fixing bath which it is desired to use at once.) (5) The use of soft water. (6) The use of water in which much air has been dissolved. (7) Washing under a spray delivering water with considerable force. (8) The use of too much alkali (especially caustic alkali) in the developer. (9) The use of too strong sulphide solution, or the use of stale (decomposed) sulphide in the sulphide toning process. (10) A strongly acid bleaching bath.

Pricking the paper back of big blisters, gently pressing out the air, and then contracting the gelatin with methylated spirit is a good plan to adopt. This procedure is not applicable in the case of a crop of small blisters. These may usually but not always be reduced by mopping the print with a piece of cotton wool dipped in equal parts of water and methylated spirit, and then in methylated spirit only.

If the print shows blisters in the fixing bath they will probably grow bigger if transferred straight to plain water. To prevent this, pass the print into a solution of table salt the same strength or proportion as the hypo and water bath, and then dilute this salt bath slowly by adding a little water at a time and rocking the dish. Another suggestion is to use two fixing baths—*i. e.*, ten minutes in 10 per cent. hypo, and then ten minutes in 5 per cent. hypo—and then 2 per cent. salt bath. Another method is to clean a sheet of ground glass with soap and water, dry it, dust it with powdered salt or French chalk, lightly brush this off the ground side, lay face down the wet blistered print on to the ground side, lightly squeeze, allow to dry thoroughly, and then strip. This is good for large prints and small blisters.

Where the trouble comes after bleaching and sulphide toning, perhaps the best preventive is the simplest of all; *viz.*, to let the prints dry thoroughly after washing and before sulphiding.

For hardening before fixing, the following have been advocated: (1) Water, 20 oz.; common alum, $\frac{1}{2}$ oz. (2) Water, 10 oz.; chrome alum, 1 dr. (3) Water, 10 oz.; formalin, 1 dr.

For combined fixing and hardening: (1) Dis-

solve in water, 10 oz., in the following order: Hypo, 2 oz.; soda sulphite, $\frac{1}{4}$ oz.; alum, 1 dr.; acetic acid, $1\frac{1}{2}$ dr. (2) In 5 oz. water dissolve 1 oz. soda sulphite, then add slowly 1 dr. sulphuric acid; add 20 oz. water, then $\frac{1}{2}$ lb. hypo; when this is dissolved, add $\frac{1}{2}$ oz. chrome alum dissolved in 5 oz. water. (3) Water, 20 oz.; hypo, 2 oz.; soda bisulphite, $\frac{1}{4}$ oz.; chrome alum, 1 dr.—*Amateur Photographer*.

Preparing Transparency Plates by the Albumen Process

THE quality of an enlarged negative depends in a great measure upon the quality of the transparency from which it is made. There are a number of methods that can be employed to produce a good transparency for enlarging purposes. The carbon process yields excellent transparencies when a special tissue is used, also wet collodion, and the gelatin dry plate. When the last-named plate is used a special plate is necessary, and the developer must be changed in its composition if the best results are to be obtained. A *rapid* gelatin dry plate produces a transparency possessing a considerable amount of grain, which being magnified produces in the enlarged negative a coarse and objectionable result. The consequence is that an enlarged print made from such a negative shows very clearly that it is an enlargement. The main cause of this is that the transparency from which the large negative has been made was defective. The difference in two prints of the same size, one made from a negative taken direct, and the other from an enlarged negative is always apparent unless the transparency from which the enlarged negative has been made was faultless. The ordinary dry plate being ready at all times is generally used because it aids rapid production, but the results are only too often very indifferent in character.

It is well known to many of the older photographers that some of the finest results ever obtained in the way of enlarged negatives were produced when the transparency employed was made by the albumen or collodio-albumen process. The finest transparencies that have ever been made for the stereoscope were also produced by this process. A transparency produced by this means possesses the soft and delicate qualities of albumen combined with clear shadows and strong high-lights which characterize collodion. It possesses all the qualities necessary for the production of perfect enlarged negatives. The method of production about to be described will enable anyone to prepare the plates from which these beautiful transparencies can be made. The basis is a collodion film which can be produced in two different ways. First by a collodion emulsion, and secondly by use of a solution of nitrate of silver in the usual dipping bath. The first plan is somewhat intricate, although it would be the best if the plates were to be made upon a large scale. The second method being somewhat more simple and easily applied, will be described here.

In the first place decide upon the size of the plates it is intended to use, procure a number of them, clean them well in a hot bath of common

washing soda (about half a pound of soda to one gallon of water), rub them well upon both sides with a small mop made by wrapping pieces of clean, white rag upon the end of a clean strip of wood. Rinse the plates one by one in a stream of water, then place them in a clean tray containing a mixture of muriatic acid (one part to twenty of water). This will rid the plates of any trace of soda. Make up the following which is to form the substratum for a preliminary coating previous to collodionizing:

Albumen (white of one egg)
Distilled water 50 oz.

Do not allow a vestige of the yolk of the egg to become mixed with the albumen. Shake this mixture vigorously three or four times during the day, then after allowing to stand over night, filter through two thicknesses of cheese cloth tied over the top end of a kerosene lamp chimney so that when the chimney is inverted it can be inserted into a wide mouth bottle or placed in one of the rings of a retort stand. This filtered mixture may now be poured into a glass graduate and the plates taken, one by one, from the acid bath, rinsed in a stream of water from a faucet, and one side of the glass coated, the excess of the albumen mixture being returned to the graduate by allowing one corner of the plate to touch the top of the graduate. The plate must now be placed in a clean rack to dry. The rule to be adopted in coating plates with a substratum is to coat the side opposite the diamond cut, because a glass-cutter who is a master of his business always chooses the rougher side for his cutting stroke. When the plates have all been coated and dried they are ready for the next operation of collodionizing and sensitizing. Procure a half-pound bottle of collodion ready iodized, the longer it has been iodized the better, and make up a solution of nitrate of silver as follows:

Nitrate of silver 2 oz.
Distilled water 20 oz.
Iodide of potassium 2 gr.

Shake this solution well, stand it out in the sunlight for one day, filter it into a glass-dipping bath, and it is ready now for use.

The following albumen solution must be prepared and kept ready at hand for use after collodionizing. It should be allowed to stand for twenty-four hours after preparation and before being used. All albuminous preparations have to stand some time before they can be filtered and used to insure a thorough and intimate admixture of the albumen with the other ingredients, as otherwise the albumen will clog up the pores or meshes of the filtering material, and completely prevent filtration.

Albumen Solution

Albumen solution (of fresh eggs) 8 oz.
Strong water ammonia 2 drams
Bromide of potassium 10 gr.
Iodide of potassium 50 gr.
Distilled water 3 oz.

The albumen must be well beaten up in a clean basin with a silver or silver plated fork until it

is well broken up, the bromide and iodide of potassium must be dissolved in the 3 ounces of water, then added to the albumen, lastly the ammonia. This mixture can be filtered in the first place by tying a piece of cheese cloth over the top of a glass funnel, and rubbing the mixture through it with a small stiff bristle brush. After this operation, it may be filtered through the lamp chimney filter already described. It is now ready for use, and must be employed in the following manner:

Three graduates will be required, two four ounces and one eight ounces. Each four-ounce graduate must be filled with the albumen. The eight-ounce graduate is to receive the excess of solution after coating each plate. Now proceed as follows: Take one of the dried glass plates, coat it with the iodized collodion, drain the excess into the bottle, move it to and fro in the air, to cause the excess of the ether to evaporate, then place it upon the dipper and insert it directly into the nitrate of silver bath without stopping. These operations may be carried on under a deep yellow colored light, not necessarily under ruby light. Move the plate up and down in the silver bath a few times, then allow it to stand still for about two minutes, lift the plate up. If a 5 x 7 plate, grasp it by the sides between the middle finger and thumb of the left hand. Drain off the silver solution, wash both sides of the plate carefully in a gentle stream of water from the faucet. Allow it to drain for a few seconds upon one corner. Now apply enough albumen to just cover the plate, and drain this albumen into the eight-ounce graduate. Turn the plate around and again coat with albumen, this time taking the second graduate. Drain again into the eight-ounce measure. The plate must now be put in a very clean rack to dry. The use of the two graduates may now be easily seen. It is to prevent any possible contamination of the albumen in use.

Where a sufficient number of plates have been coated, stand them away in a dark, warm closet to dry. As soon as dry they are ready for the next operation, which consists of sensitizing the plates once more. This will render the bromo-iodized albumen surface sensitive to light. To accomplish this, another nitrate of silver bath will be required, made up as follows:

Recrystallized nitrate of silver	600 gr.
Distilled water	20 oz.
Glacial acetic acid	10 drams

The plates must now be dipped into this bath and allowed to remain in the solution for five or six minutes, using a glass or hard-rubber dipper the same as employed in the previous sensitizing. The plate must now be washed well and flowed over with a strong solution of gallic acid, the strength being near to saturation point. The plates must now be allowed to dry spontaneously in a warm closet. They may then be packed the same as ordinary dry plates or placed in a dry, grooved plate box ready for use. Great care must be exercised to prevent the surface of the plate from coming into contact with the fingers, as every mark will show upon the development. Transparencies may be made with these plates

either by contact or in the camera. If made by contact the negative should be first varnished. The time-exposure will be about fifteen times as long as that required for an ordinary gelatin transparency plate. It will be found to be an advantage to overexpose rather than underexpose, because the development can be kept well under control. It will also be observed that the acid nitrate bath will turn a reddish-brown color after the plates have been sensitized, but this will not prove detrimental to the sensitizing of the plates. Having made an exposure upon one of the plates, develop in the following manner. The solutions for pyrogallic development must be made up as follows:

1.—Pyrogallic acid	192 gr.
Alcohol	2 oz.
2.—Potassium bromide	24 gr.
Distilled water	2 oz.
3.—Ammonium carbonate	160 gr.
Distilled water	2 oz.

Take twelve minims of No. 1 in a clean glass graduate, one dram of No. 2, and six drams of No. 3. Rinse the plate in a running stream of cold water, drain off the excess, then with one sweep flow the developer over the plate. Rock the plate a little, return the developer to the graduate, then flow again. Keep the developer in motion upon the plate by tilting. The image will now quickly appear. It will look very different from an ordinary gelatin plate. The image will be very thin when viewed by transmitted light. It will be very full of detail, but may require strengthening. This is done by applying a small quantity of the following redeveloper with a few drops of a thirty-grain nitrate of silver solution added.

Pyrogallic acid	12 gr.
Distilled water	6 oz.
Citric acid	3 gr.

The first developer must be washed off and about half an ounce of the above used to flood the plate. It will be observed now that the image becomes very much strengthened. As soon as the required density is attained wash the plate and fix it in a solution of hyposulphite of soda, four ounces to twenty of water. When fixed, wash the plate for about a half a minute in a gentle stream of water. It may now be placed aside to dry. Upon examination it will be observed that the image is of a wonderfully delicate gradation necessary for the making of a first-class enlarged negative.

Ferrous oxalate developer may be employed with these plates, which also gives excellent results.

It may be advisable to point out here that care must be exercised in the practice of making albumen transparencies, particularly in the developing of the exposed plate, which is accomplished by holding it by the top left-hand corner after it has been wetted, then pouring only just enough developing solution upon the plate to cover its surface, and admit of its being rocked slightly so that the developer can be made to flow forward and backward upon the plate. To undertake to develop in a tray like an ordinary

gelatin dry plate is not at all necessary. The developer used for the albumen dry plate should never be allowed to come into contact with a tray that has been used for another kind of developer. The quantity of solution required for development is very small. It is also pointed out here for the benefit of those who are not acquainted with the wet-collodion process that the dipping bath and dipper referred to consist of a vertical glass vessel made in various sizes. The one best suited for the above class of work would be eight inches wide and ten inches high, so that a plate 8 x 10 could be inserted, the depth of the vessel being about one inch, all the above being interior measurements. The dipper also mentioned is made either of glass or hard rubber, the latter being the best suited for the purpose. This implement is for lowering the plate into the bath and lifting it therefrom without contamination from the fingers. The plate may be dipped into the nitrate of silver solution for sensitizing and withdrawn at will. When the sensitizing is completed, the dipper should be returned to the silver solution and allowed to remain there at all times until required for use. These glass dipping baths and dippers can be purchased from any large photographic stock dealer, fitted into a suitable case with cover for their complete protection from breakage or the action of light. All these processes for a small amount of wet-plate work, as this process is called, may be carried out in an ordinary dark-room with ordinary caution, providing that no free ammonia is permitted, as this would be liable to injure the nitrate of silver solution. All that will be necessary will be to set up this class of apparatus in a separate part of the dark-room upon sheets of thick blotting paper, so that any solution of nitrate of silver that may be spilled will be instantly absorbed. The little extra trouble necessary to the production of the albumen transparency will be amply rewarded by the production of a transparency that has never been equalled by any other known process. It must also be understood that only that part of the wet collodion process that is necessary to carry out the work required has been described here. There being no protosulphate of iron employed, nor liquid developer made up with the above iron salt, nor other chemicals that are used in the wet-collodion process, an ordinary dark-room may be employed to prepare these special plates without fear of injury to the gelatin dry-plate process that may be carried on in the same room. Development of prints made upon paper printed by artificial light may also be carried on under these conditions. The slight odor coming from the ether and alcohol of the collodion will not be in the least detrimental.

Multiple Toning of Bromide Prints

PRINTS in more than one color will be found a decided improvement on the ordinary print of only one tone. They are specially effective for child portraiture. Monochrome prints often have a more or less flat appearance, but this flatness entirely disappears when a second tone is introduced.

Two tones will be generally found enough for a picture of a child; the usual black-and-white, with the head, arms and legs toned brown. For adults, three or more tones may be used with advantage.

The most satisfactory results are obtained with an absolutely white background, but this is by no means essential. The child should be seated on the floor, playing with some toys, or in any simple and natural attitude.

The print is first made in the ordinary way on a matt Bromide paper. Some makes which give good grays and blacks, do not tone well; to yield a good sepia by the sulphide method, is a severe test for a really good bromide paper.

When the print is quite dry, it is ready to be treated in the way described below. The parts to be toned brown, are first bleached locally with the following solution:

Potassium ferricyanide	$\frac{1}{2}$ oz.
Potassium bromide	$\frac{1}{2}$ oz.
Water	4 oz.

This bleaching has to be done very carefully with a brush with a sharp point. I have found by experience that a small, fine camelhair brush, size No. 3, is the easiest to use, and gives the best results.

It is very important that the bleaching should be carefully confined to those parts that are to be toned; that is to the head, arms, hands and legs; in some cases toys or other accessories may be treated in the same way.

Take the *dry* print, sit in a good light, dip the brush in the ferricyanide, and begin on the head. Pass the brush over it, taking care not to go beyond the edges of the hair, neck or other outlines, nor to allow the solution to run. Then the arms and legs, if bare, must be done, and any other parts in the same way. The bleaching formula given is much stronger than that commonly used for sulphide toning, and will fully bleach the image almost at once, so that it is unnecessary to go over the same part twice.

The print must next be washed quickly in water, care being taken to keep it moving at first, to avoid spreading the solution which might partly bleach the neighboring parts, even in a diluted condition.

When all trace of yellowness has disappeared from the high lights, place the print in a solution of sulphide or sodium. It is best to have a 10 per cent. solution of this, and dilute a small portion of it with about ten times its bulk of water. It may be applied with a brush. The used solution must not be kept.

The print must then be washed for about half an hour in running water or several changes, and dried in the usual way; it will be quite permanent.

Having gone so far, you may be tempted to proceed still farther, and introduce a third color, or even more. Take for instance a suitable print of a girl in evening dress. You may tone the hair brown; the face, neck, and arms flesh-colored; and a ribbon in the hair or a sash, pink. To do this, you proceed in exactly the same way as with two tones. First brush over any part that you wish to tone brown, flesh-colored, or

pink with the ferricyanide, and tone with sulphide as before. Then, after a few minutes' washing, blot the print as surface-dry as possible, and apply some strong gold-toning bath to the flesh, ribbons, and so on, taking great care to avoid the hair. The ordinary gold and sulphocyanide formula will do; a very little of equal parts of each should be mixed in a measuring glass, but must not be diluted with water as for P. O. P.

This will need even greater care than the first toning, as the print is not quite dry; but it will be found easy to prevent the solution from spreading if the print is dipped into water and then blotted again before any more solution is applied. A quicker method than the blotting, is to *blow* the moisture off the part that you are working on. When you have got the correct color for the flesh tones, you stop working on them, and continue on the pink trimmings for a little longer. Then wash well before drying.

A similar plan may be adopted with landscapes. Very effective results may often be obtained with only two tones, the original gray and the brown sulphide tone suitably disposed; but bolder workers may try toning the trees green, the sky blue, tree trunks and earth, brown; leaving a gray-stone house its original color, but perhaps giving it a red roof.

A good blue toning bath, which gives a prussian-blue image is as follows—it is strong to render toning less tedious:

Ammonio-citrate of iron	$\frac{1}{2}$ oz.
Potassium ferricyanide	$\frac{1}{4}$ oz.
Glacial acetic acid	$\frac{1}{2}$ oz.
Water	10 oz.

The following gives good greens:

Vanadium chloride	10 gr.
Ferric chloride	4 gr.
Ferric oxalate	5 gr.
Potassium ferricyanide	12 gr.
Saturated solution of oxalic acid	2 oz.
Water up to	5 oz.

The color is more or less blue at first, but changes to green on washing, which must be very thorough.

An unlimited variety of shades of brown may be obtained by the sulphide method, if varying proportions of a solution of perchloride of mercury are added to the ferricyanide, when bleaching; the larger the quantity of mercury, the colder will be the color when the sulphide is applied.

This method is useful for ordinary all-over toning, and will yield a satisfactory sepia with a weak overexposed print, which otherwise would probably tone to a sickly yellow.

The Photographic Value of a Wet Day

THE practice of photography is generally associated with sunshine and clear skies, but those who only take out their cameras when the weather is fair, miss many attractive subjects.

A wet day—not one on which there is a continuous downpour, but a bright, clear day with occasional showers to keep the pavements wet,

is admirable for street scenes; every pedestrian, every vehicle, every pillar, and lamp-post is reflected in the glistening roads, and these reflections not only effectively break up any large expanse of foreground, but also provide contrasts of light and shade, which materially help to brighten the picture.

A village street is usually a difficult problem, because the want of height in the buildings makes the road fill even more of the foreground than it would in a town street, but on a wet day the whole of this undesirable foreground can be broken up, by judiciously arranging a cart, or one or two children, to fully utilize the reflective value of the principal puddles.

Ornamental buildings, statues or archways make excellent studies behind a wet pavement, and exhibition buildings with their ornate architecture and smooth flagged courtyards are at their very best in wet weather.

On wet days exposures do not need to be increased, because a wet pavement reflects light instead of absorbing it, and buildings on which the sun is not actually shining are never better lighted than on a wet day, and therefore yield more detail.

For night photography wet weather is always chosen because of the reflections.

Some Lantern-slide Methods

IT is often an advantage and a relief from the monotony of black or brown lantern-slides, to be able to put into the lantern among them slides of other colors. Probably the best known method of obtaining them is by the carbon process, but this has the great objection that at that period of the year when lantern-slides are most in request, the sunlight, and sometimes even the daylight, which is essential for carbon work are non-existent.

There are, however, at least two other processes which will give the desired results with less trouble than the process already mentioned. The first of these is an adaptation of the Ozobrome printing process, and has for its basis an ordinary bromide lantern-slide exposed, developed, and fixed in the usual manner. The bichromate and chrome alum solutions may be satisfactorily made up to the Ozobrome formulæ, and the plaster should be cut to a square of three and a half inch sides.

The lantern-slide, which has presumably been dried, is soaked in water for about five minutes, and the plaster is put into the bichromate solution for from two to three minutes, and then, after draining off the superfluous liquid, it is immersed for about twelve seconds in the chrome bath, quickly removed, and brought into contact under water with the film of the lantern plate; the two are squeegeed together, care being taken to avoid slipping of one on the other, and left under pressure to ensure continuous and complete contact for about twenty minutes.

If the pair be laid plate upward and pressure be applied by a glass plate, the progress of the reaction can be watched, and when completed there will appear to be a negative image formed by the white silver compound against the dark background of the plaster which is visible through

the clear glass of the high-lights. When this condition is obtained the plate and plaster are removed to a dish of water at a temperature of 40° C. After a short time the pigment is seen to begin to ooze out round the edges of the plaster, which is a sign that the two may be separated by a steady, gentle pull from one corner. The warm water may then be gently splashed over the slide until most of the soluble gelatin is removed, the final clearing up being done by pouring hotter water over the slide held in the hand, selecting those portions which it is desired to reduce, then rinse in cold water and leave to dry. The white silver image is removed by immersion in dilute hypo (one in ten or twelve) containing just enough ferricyanide to color the solution. After washing and drying the slide is quite permanent, and is ready for binding.

A second method, and perhaps a simpler one than that described, although its product cannot claim the same permanence, is that in which the reduced silver of the ordinary lantern-slide is first bleached in a solution of $\frac{1}{4}$ per cent. iodine in 1 per cent. potassium iodide, and, after washing in water to remove the excess of iodine (a little sulphite added to the water will hasten the process), the plate is put into a dilute dye solution. The bleached image acts as a mordant for the dyestuff, and a picture is obtained corresponding in color to the dye used. The whole of the film will be stained by the color, but this is easily removed by washing with 1 per cent. acetic acid, after which a short wash in water completes the process. For this method the original slide should be above the average in density, and it is not desirable as a rule to remove the bleached image by fixing in hypo, as the dyestuff alone is generally deficient in density. Suitable dyestuffs for this process are: methylene blue, acid green, auramine, fuchsin, and generally the amido dyes. Multiple colors are obtained by local bleaching, the iodine solution being applied with a brush to those parts which are desired to be of the same color, and the process is then carried through with the proper dyestuff, the iodine is then applied to other portions of the plate, and they are dyed in a second dye bath, and so on until the whole plate is completed, and even then the remaining uncolored portion, the high-lights, may be tinted by immersion in a suitably colored dye bath, and for this other dyes, such as eosin, which have a greater affinity for gelatin, may be used. A convenient way to keep the dyes is in 1 per cent. solutions, and as a rule about 1 c.c. in 50 c.c. of water will be enough for several plates.

It is often necessary to amplify a set of slides at short notice with copies of pictures, drawings, or maps, and for this purpose the following quick method is very useful. The exposure in the camera is made upon a fast lantern plate, film to the lens. The exposure should be full, generally about forty times that which would be given for a special rapid plate under the same conditions. Development is carried very far, until the detail is nearly lost, then the plate is rinsed and bleached in a solution of $1\frac{1}{2}$ per cent. of concentrated nitric acid and $\frac{1}{4}$ per cent. potassium bichromate, which dissolves out the whole of the developed image. The bichromate

is then washed away and the plate returned to the developer previously used; after immersion for about a minute it is exposed to a full light, when the positive rapidly appears. When sufficiently developed, it is quickly put into 25 per cent. hypo and fixed. This last operation is theoretically unnecessary, but unless the first exposure and development have been very accurately performed it is best to be prepared for it. The positive picture thus obtained may, of course, be put into the lantern as it is, or may be toned or finished, by either of the methods described above. It should be noted that by this method a reversed picture is obtained, and the slide, after being finished, should therefore be spotted on the opposite side to that usually employed.—*British Journal of Photography*.

Two Pictures on One Plate

To make half-quarter negatives (writes Mr. T. H. Greenall, in *Photography and Focus*), the most advantageous plan, in that it saves handling of plates, is to alter the back of a quarter-plate or $3\frac{1}{2}$ by $2\frac{1}{2}$ camera so that it will take quarter-plate dark-slides and give two half-quarter exposures on each quarter-plate. One way to do this is to make the back so that the dark-slide may be pushed in from either side, or from top or bottom, the opening in the back being reduced to half-quarter. To get the opening centered with the lens, either the lens may be adjusted, if there is a sliding panel, or the back may be enlarged a little, so that it projects at one side of the camera, though this arrangement is certainly a little clumsy. Happily, if the lens is an anastigmat of good covering power, it is not absolutely necessary that it should be centered exactly. The back must be so arranged that, when the dark-slide is pushed in from one side, one-half the plate is exposed, and when it is exposed from the other side the other half is exposed.

The Adapter Back

AUTO engines, dynamos, and mules have each their own pet form of back kick. The amateur or professional photographer who feels the limitations of most hand cameras seems to have no way of indulging in any kind of a kick. Like the man six feet two in the upper berth of a Pullman, the pictorialist feels a trifle cramped when using these dainty instruments with their dismal lack of rising front and their short focus lenses. The writer has no quarrel with small cameras. They are just the thing for tourists and other emergencies.

Every pictorial as well as commercial or press photographer should have one vest pocket filled with a miniature camera always ready to catch the fleeting emergency picture. Suppose you have spent the day with a man-sized camera in some village, taking pictures of the local churches, monuments, and such, for commercial post-cards, or you have tried all through the soothing hours of a warm afternoon to find out why cows and horses persist in waving their artistic tails. You arrive at the railroad station about five o'clock. While waiting for your train, in comes a wildcat

engine that stops for water. With a roar, off goes the safety valve. A picturesque cloud of steam is bathed in the low rays of the yellow sun. You yank out your vest pocket *f/4.5* and let fly. You leave it in a solution of yeast over night, label it, preparedness, and get a Salon first prize. Perhaps. The point is to have the proper tools to work with. All the other pictures you took that day were of such a nature that speed of preparation of camera did not enter as a factor in their success. They were composed full-sized on the ground-glass. Plenty of rising front, reversible back and swing back, and a battery of lenses made the trimming of several inches of foreground on each picture unnecessary. Too much history will produce hysterics in the most prosaic, but one must risk that in order to present logically the evolution of a great idea.

Unnumbered years ago the writer "blew himself" to a 5×7 reversible-back plate-camera capable of twenty-inch extension. After the manner of an auto bought without figuring the cost of running it, the cost of plates and paper soon forced the large camera into innocuous desuetude or something equally picturesque. The $3\frac{1}{2} \times 4\frac{1}{2}$ size carried the day for several years. Then came the thought of using kits in the large camera. Kits like kittens should be drowned as a squeaky nuisance. The less said about kits the better. In theory they are ideal, in practice they are awful beyond the words of tongue or pen. Imagine trying to use films in kits!

Another lapse of years was required to evolve the new idea which again brought the old camera from its long-suffering oblivion out into the daily life of an ambitious pictorialist. Instead of using kits for smaller sizes, an entirely new back was built out of brads, glue, cigar boxes and divine energy—a rare mixture known only to the true artist. This new back is reversible and slips on and off the camera as quickly as the original 5×7 back, which can still be used if desired. Two such reducing backs have been made for the 5×7 camera, one for post-card size film-pack adapter and one for a $3\frac{1}{2} \times 4\frac{1}{2}$ film pack adapter and plateholders of the same type. Each back has a ground-glass slide carefully made to give exact focus. While in the first enthusiasm of the idea, the writer even went so far as to make a reducing back for the $6\frac{1}{2} \times 8\frac{1}{2}$ camera to take all the 5×7 backs. The difficulty of using short-focus lenses with the long, square bellows rather dampened the success of this venture. In the 5×7 camera the bellows does not interfere with the freedom of motion of a four-inch lens, which is really a wide angle for the post-card.

A long, detailed description of just how these backs were constructed would only weary the casual reader, the confirmed hand-camerist would be only the more confoundedly sot in his ways, and the man who really cares to economize in plates or films and save the bother of enlarging in the sizes chosen will have energy enough to get his back up and build one or two backs by the cut and try method. Old 5×7 or 5×8 plate cameras with R. R. lenses are a drug on the market and until the adapter back gets to be all the rage, you should be able to pick up

such a camera for the price of a single theater party.

The next layer has two long pieces $8\frac{1}{2} \times 2$, with short pieces $4\frac{1}{2} \times 1\frac{1}{2}$. In each layer the long pieces are run in opposite directions from the long ones in the layer below. The quickest way to cut thin wood in the direction of the grain is to use a sharp jackknife, point guided along the back of a saw blade laid flat on the wood, using a series of light strokes that will not split the wood. Pieces of the same size can be cut at the same time at a great saving in the labor of measuring.

The more layers the stronger and heavier is the back. Three is the minimum, with four as the optimum. Use both glue and brads to fasten the thin layers together. Common pins, preferably of brass, make ideal brads provided you cut their points off before driving them in.

To prepare the nest for the film-pack adapter, the last layer or a special layer is made with the rectangular hole a sixteenth-inch larger all around than the actual opening in the adapter or plate-holder. Have the long pieces for this go the short way of the plate, because the end where the adapter or plateholder will slide in cannot be built up later, as are the other sides, to keep out the light. So this side is made a trifle lower than the other three, and a piece of black velvet ribbon is glued over it to make a light-tight seal.

Lay the plateholder or film-pack adapter face down on this smooth surface, and on the three sides, away from the velvet ribbon glue pieces of wood just the thickness of the flange on the adapter or plateholder. On top of these strips go the strips of aluminum or brass plate that fit over the flange or into the grooves in the holder which fits snugly under the projecting edges of these metal strips, making a light-tight joint. If these metal strips are held in place by screws they can be tightened or loosened at will, to allow for wear or for dampness. Wood can be used in place of metal if the holder has a simple flange, but it pays to get metal for a grooved holder.

Make a ground-glass slide on the same principle of built-up layers, with the longer pieces alternating in direction. Be sure the ground-glass comes the same distance from the smooth sliding surface that the emulsion does.

Detail Description of Adapter Back

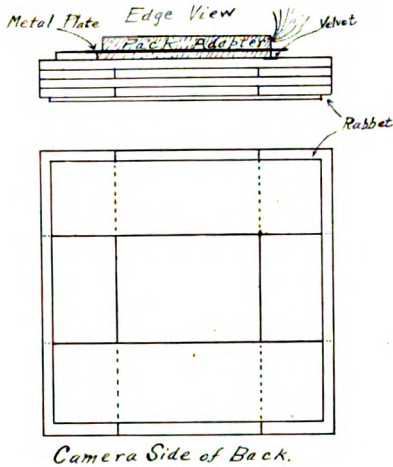
Cabinet-makers and camera manufacturers, who value their sanity, had better skip this attempt to give some of the fundamental principles involved in the building of an adapter back.

The working basis starts with the camera as a model and builds up the new back by a series of successive layers of thin seasoned wood, applied one layer at a time, until the desired rigidity is attained; then attention is concentrated on constructing, over and around a hole in the new back, a nice snug nest for the small adapter or plateholder.

Like the puzzled baker with his cruller, your real problem is how big to make the hole. The back must be light in weight, as well as strong,

and incidentally contain an aperture somewhere near the size of the small plate or film.

Use the camera with its own back off as an intaglio into which are fitted the first two layers of the new back. The thickness of the first layer is determined by the depth of the rabbet in the back of camera. Each layer will require four pieces of wood, two long and two short. In each successive layer the direction of the long pieces is at right angles to the long ones of the layer above and below. The bird-like quality of lightness, coupled with strength given by this method of construction, approaches closely what is technically known as dovetailing.



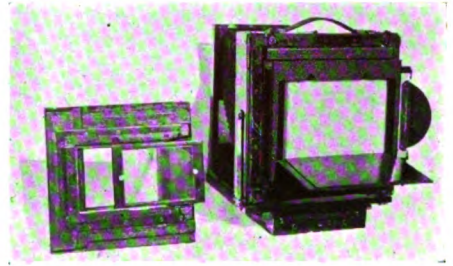
To give a specific instance: my 5 x 7 camera has a square back with outside dimensions $8\frac{1}{2}$ inches square. For the post-card adapter back the first layer (next to the camera) is of sixteenth-inch wood (the depth of the rabbet) and has two pieces $7\frac{7}{8} \times 1\frac{1}{2}$ running parallel to the horizon, above and below the long dimension of the post-card. Between the ends of these long pieces and in the same plane fit snugly two shorter pieces, $4\frac{3}{8} \times \frac{3}{4}$ inch.

Like the proverbial tortoise, you have now overtaken and passed the rabbet with a "bet" on it, and are now ready for the back proper, which is as simple to build as a matchstick cob house.

Leaving the first layer in place on the camera, dab on a little glue and lay on the next layer of four pieces of regular cigar-box wood three-sixteenth inch thick, two pieces $8\frac{1}{2} \times 1\frac{1}{4}$, and two pieces 6×2 inches.

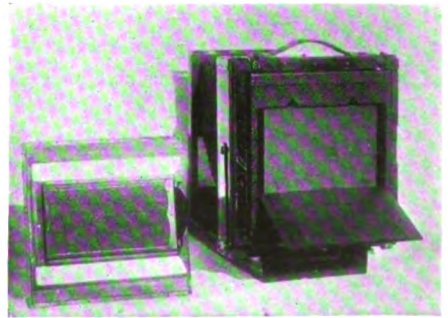
Added to the advantage of the ground-glass and of using long focus lenses on subjects that require them, the adapter back enables one to use what amounts to an over size rising and falling front and the luxury of a swing back. By arranging the reversible back for an upright or vertical picture, and then turning the camera on its side, you are fixed for a horizontal picture with a lens that can slide sideways instead of up and down. This makes a handy arrangement

for equalizing the focus when one wants to photograph a near object in one side of the picture and a distant vista on the other. A possible instance of this would be a shop window showing a glimpse down the street, or a cliff close up on one side and a distant landscape on the other.



To right is the $6\frac{1}{2} \times 8\frac{1}{2}$ with adapter back for 5 x 7 with its film pack. Takes A. P. C. and $3\frac{1}{4} \times 4\frac{1}{4}$ adapters also. To left the adapter back for $3\frac{1}{4} \times 4\frac{1}{4}$ pictures in 5 x 7 cameras.

Both the pictorialist and the commercial post-card photographer would derive from the adapter back a great and lasting economy out of all proportion to the tinkering required to make such a back. The lazy and the rich can have such backs built to order and still effect an economy. The use of lenses for from 4 to 20 inches focus or even telephoto to get *just* what you want on the size plate used, saves in most cases the expense and bother of enlarging. The few gems that the pictorial photographer does work up to exhibition size would have the largest possible sized image at the start.



To left is P. C. size adapter for 5 x 7. The white strips each side of film back are heavy sheet aluminum slides for F. P. adapter. Pressure can be adjusted in screws through these plates. To right, $6\frac{1}{2} \times 8\frac{1}{2}$ adapter back for 5 x 7 takes all other 5 x 7 backs.

You respond, "Yes, all these advantages have weight, but I do not like to lug weight around on the surface of the earth." The writer's 5 x 7 camera, with adapter back for either post-card or $3\frac{1}{4} \times 4\frac{1}{4}$ weighs exactly five pounds

loaded for twelve shots. Add a pound more for an extra filmpack and a handful of lenses and color screens, and the grand total reaches six pounds. Then there is the tripod, but please remember that your winter overcoat weighs a neat eight to a wealthy twelve pounds. As you swagger loftily down Fifth Avenue of a winter morning it floats about you light as a halo. Then why grumble even mentally at the added two or three extra pounds in excess of a two or three pound hand-camera equipment, when you go out to conquer cold, cruel Nature? You are much more liable to bring home a bunch of plump and husky prisoners from her artistic realms, with a twenty-inch than with a mere four-inch outfit.

With the four- or five-inch anastigmat and focussing scale the outfit makes a remarkably steady hand-camera, if need be, which is the very last word in the direction of complete preparedness.

As a final touch, insert the pegs that hold the new back in place on the camera. File or chop off the heads of eight nails of the proper length and diameter. File or grind the rough ends of the cut-off nails until they are round and smooth. Strap or bind the new adapter-back securely in place on the back of the camera. Drill holes about three-quarters the diameter of the nails, using the loops of the camera as guides for the drill. Drill the holes as far from the camera as possible. You can file off some of the nail easier, after it is in, than you can move it around in the wood. As these nails may come so near the corner that they may meet and cross each other in the wood, the holes for them should be drilled enough off from the "straight" that they will not meet. When one set of nails is in place, reverse the back and put in the other set. To prevent any tendency to warp, leave the new back on the camera for a few days till it settles down to business.—*E. Blake Whiting.*

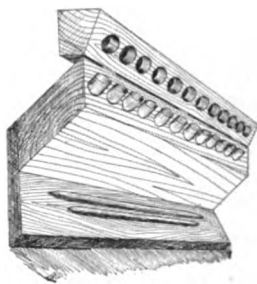
Rack for Holding Retouching Colors

So many uses come to us almost every day now in photography for the little books of transparent water-colors which are put out by the camera firms and which help so much in even reproducing snapshots and "jiffy" pictures. But the outfit, as it comes, consists of the book and a little enamel pan, only, with, of course, two or three brushes. And it is always more or less of a bother, especially if one is constantly dabbing into the colors, to resort to the piece-meal method of mixing his colors in the one enamel dish.

I, for one, long ago, discarded this method, and for some time have, immediately upon purchasing a new book of colors, mixed up a small quantity of each color and put it in a series of small pill bottles, those without a neck being preferable. At first, these were stood about on the table, always in the way, until I had experienced much trouble and wrath over spilled colors.

Then, I made a stand for them by boring holes into a one-inch board, and tacking a thick piece of pasteboard over the bottom. This, still, was not overly compact and safe, and finally I made a device, such as is shown, to hold the bottled colors.

The upright is a short section of a "2 x 4," with the top cut at an angle, which is hinged to the lower piece. The upper holes, to accommodate the tops of the bottles, are larger than those in the lower section, for obvious reasons. To make the finished product less cumbersome, I dressed the block down to approximately 1½ x 3 x 16 inches. The bottom is a suitable section of a soft-grained, half-inch board. The block is also preferably of soft wood. The base not only holds the brushes and other tools, but serves as a stable base for the whole. Two strips of elastic tacked over these grooves would serve to hold said brushes in place when carrying.



The top shuts down over the bottles and clasps two small hooks. There is a leather strap fastened to the top to serve as a handle.

To remove all doubt as to the exact location of each and every color, the name of the color was printed just below that bottle.

The whole was tinted a bright green, with some green ink, and, altogether, it presents an attractive as well as serviceable appearance.

Permanganate Bleach for Bromides

IN order to prevent waste of sulphide the main thing is to rinse the prints free from acid before putting them in the sulphide solution. There is, however, no objection to using a clearing bath before sulphiding provided this is not used too strong, and also contains a little salt or hydrochloric acid. The following is a perfectly safe clearing bath for either permanganate or bichromate bleached prints: Mix 4 drams of 25 per cent. solution of sulphide of soda with, say 3 ounces of water, and add 5 drams of 25 per cent. solution of pure hydrochloric acid. Keep in tightly, and preferably rubber, corked bottles. Dilute 1 ounce with 3 or 4 ounces of water for use, and use only so long as the solution smells of sulphurous acid. Rinse the prints before sulphiding. The addition of the salt is not necessary when hydrochloric acid is used, but the presence of chloride is a safeguard in case the bleaching has not been quite complete.

Regarding the weak spots on print such might be caused by contact of the bleached print with particles of undissolved salt, or sulphite, both of which are solvents of silver chloride when in strong solution. Spots which regain their density on re-toning point, however, to exhaustion of the original sulphide solution.—*T. H. GREEN-ALL in British Journal of Photography.*

Amidol Developer

SOME fifteen years ago I used exclusively amidol on my bromide enlargements, getting black-and-whites nearer resembling iron oxalate than with any other developer; but owing to the lack of keeping qualities after mixing I turned to metol-hydro.

About two years ago I came into possession of a formula for an acid stock solution to which is added amidol and water, and which will keep in that solution for two or three days. This has so simplified the developing that I have used nothing else for over a year.

I also find this an excellent developer for lantern slides, and where a plate is inclined to show fog I find it keeps the plate clear. It is a slow working developer, the proper time for good snappy prints being about one and a half to two minutes. For sepia it is excellent.

Here is the formula:

Stock	
Water	40 oz.
Dry sulphite	6 oz.
Citric acid	120 gr.
Iron sulphite	1 oz.
Bromide potash	4 drams
For use	
Water	10 oz.
Stock	2½ oz.
Amidol	30 gr.

The developer does not deteriorate very rapidly, hence will go as far as metol-quinol.—
EDWARD J. DAVISON in *American Annual of Photography*.

Rollable Backgrounds

A BACKGROUND (writes L. B., in *Photography and Focus*) which has been painted with ordinary oil does not roll up without cracking, but it may be of service to indicate how this can be prevented. A quarter of a pound of soft soap should be stirred up in a pint of boiling water until it has all been dissolved, and this solution, a little at a time, should be added to its own bulk of the oil paint, thoroughly stirring it in until the mixture is complete.

The Surface for Trimming Prints

OPINIONS differ (says a writer in *Photography and Focus*) as to the best surface on which to trim prints. The old handbooks used to recommend either a sheet of plate glass or zinc, but few photographers would be likely to employ either today. Zinc soon gets scratched and useless—or at least undesirable—while both zinc and glass are open to the objection that they are very severe on the edge of the cutting blade. On glass, moreover, unless something is done to prevent it, the print slips about, and makes it necessary to use great care to avoid making a cut where it is not wanted. To prevent this, smearing the glass with mountant and letting this dry has been suggested, while with the same object some workers keep an old negative on which to do the trimming, using the film side,

of course. A better plan than either is to use a sheet of linoleum. This blunts the edge of the knife pretty quickly, and so the cut should not be carried further than is actually necessary to trim the edge of the print; but there is no risk of turning the edge, as there is no glass or metal. A sheet of cardboard may be used for the same purpose, or a smooth pile of newspapers; but linoleum seems to offer more advantages than any.

Local Reduction of Negatives

IT is frequently necessary to reduce the intensity of portions of a photographic image without in any way altering the remainder, less frequently perhaps since the introduction of persulphate, but still an almost everyday operation where the best class of print has to be obtained.

There are two principal methods of effecting the desired end—chemical and mechanical, the one being the local application of the well-known reducing solutions, while the other depends upon abrading or scraping away a portion of the deposited silver. The chemical method is perhaps the favorite, as many photographers are still nervous when the use of the knife is suggested, and they know of no other way. The ferricyanide and hypo solution introduced by Mr. Howard Farmer is the most generally used, and if applied with some small degree of dexterity gives most excellent results. For local use it should be fairly strong, as it is then quicker in action and less liable to wander on to parts of the negative which do not require its ministrations. I have found a 10 per cent. hypo solution, rendered a bright lemon-yellow color with a string solution of potassium ferricyanide, to work well and quickly. Care must be taken not to use too much ferricyanide solution, or it will work too quickly, and show streaks where the brush or pad has been used. It is desirable to use perfectly fresh ferricyanide solution; dissolve a few crystals in a small graduate, throwing away any which may be left.

Some sort of a desk is absolutely necessary, especially with large negatives; the easiest way of arranging one is to rest a sheet of stout glass on two blocks of wood, or even small boxes on the bench or in the sink, one end being slightly raised, so that the direction of the flow of any surplus solution can be predetermined; beneath the glass a piece of opal glass serves as a reflector, so that the reduction may be watched without lifting the negative.

The best condition for the film is when it has been drained long enough for all loose moisture to have disappeared. If too wet it will be difficult to keep the reducer from spreading, and if too dry there is danger of showing a sharp outline to the work. A camelhair brush in quill or a small pad of cotton wool is used to apply the solution, which must be applied sparingly and quickly distributed over the area to be reduced, fresh solution being applied from time to time as may be required. A pad or damp cotton-wool is convenient for quickly removing the reducer when it has done its work, and after this the negative should be put under a spray to wash as after fixing. Some workers prefer to follow the

reduction by immersion in a clean fixing bath, but I have not found this necessary when using the solution at the strength already mentioned.

Besides the Farmer reducer there are many others suitable for local application, notably the iodine and cyanide solution as used by bromide workers. This must, of course, be used in a more concentrated form for negative work, as the deposit of silver is much heavier. It must be remembered that cyanide fumes are extremely poisonous, so that it is not desirable to get the mouth and nose too near the negative while the solution is upon it. Apart from this the solution is an excellent one, and does not alter the color of the portion treated with it.

There is one method of reduction which stands midway between the chemical and mechanical, and that is the use of "ozone bleach," which in action seems to be very similar to "eau de javelle." If a negative is immersed in a solution of this, the gelatin becomes softened and the image is removed bodily. For local reduction the negative is entirely immersed, and when the surface is softened a soft camelhair mop is used to remove any desired portion. The objection to this process is that it is difficult to avoid removing more of the film than is necessary.

Turning to purely mechanical methods of reduction, the most simple is friction with a piece of fine chamois leather, moistened with methylated spirit. This is frequently used for the reduction of overexposed and halated windows in interiors, and for this purpose it answers very well, as the patch to be reduced has no decided outline, and consequently the rubbed portion, which softens off gradually, is not at all in evidence. In cases where the patch to be reduced has a sharp outline it is difficult to keep clear of the surrounding parts, and consequently the patch is surrounded by a dark halo. Another attrition process is known as Baskett's. Here, instead of methylated spirit, a sort of pomatum is used, the formula being:

Salad oil	1 oz.
Terebene	$\frac{1}{2}$ oz.
Globe polish	1d. tin

This is rubbed on with a soft leather or rag, and the reduction goes on fairly rapidly; it is easier to keep to an outline than with the spirit as a lubricant. A very elegant method of mechanical reduction is furnished by the "Negafake" pencils and lubricant. These work on the same principles, but permit of the finest details being dealt with. They consist of fine crayons or leads made of a composition which, when used for retouching, removes a portion of the image instead of adding to it. Effects equal and in some cases superior to fine knife work can be obtained without the exercise of any great skill. Dry powders, such as pumice and cuttle-fish, have been recommended for local reduction, but they are very prone to give "scratchy" or granular results, and are not to be recommended.

The retouching knife is often the best local reducer, especially for fine detail which cannot be treated with a liquid reducer or by rubbing. As its use pertains more particularly to retouching, I will not deal with it at length, but will

merely give one or two hints. One is that the gelatin film must be absolutely dry. Another is that the knife must have a fine and keen edge, and must be held nearly at right angles to the film; and a third is that the lightest possible shaving should be taken off at a time. The knife must be firm enough not to "chatter" or jump when scraping, or a succession of lines across the line of scraping will appear. A really good penknife or a surgeon's scalpel are very suitable.—*British Journal of Photography*.

Focussing Sharply

MANY folks would say that there was little that could be written on the subject of focussing. It is so "simple," that anyone could do it, once they knew what was required. But the more experienced the worker, the less likely is he to treat this important operation so lightly, for he knows that not only may he often be able to halve his exposure by skilful focussing with a larger aperture than a novice would employ, but that he can add to the pictorial value of his work by careful attention to the nature of his subject and the employment of what has been called "selective" focussing. Like almost all other photographic manipulations, focussing calls for a little forethought in securing the best conditions in the way of providing a suitable ground-glass screen and a properly adjusted and convenient magnifier.

The surface of the ground glass should be of a very fine grain and not like, as is often the case, the texture of a piece of loaf sugar. "Acid Etched" glass is often recommended, but as there are various grades, a very fine grain must be selected in this also, for a coarse "etched" surface is almost vermicular in its texture and is worse for focussing purposes than even a coarsely ground one. The best quality for focusing screen is known as "finely ground patent plate," and this may be obtained from most large glass warehouses, or through the ordinary photographic dealers, who would procure it to order. Nearly all ground glass is improved if rubbed over with a little vaseline which is polished off with soft paper until the merest trace is left. This greatly increases the apparent luminosity of the image and takes away the "dry" appearance of the surface.

A compound eye-piece of the Ramsden type is the most convenient form of focussing magnifier, and this should be adjusted to suit the vision of the user by making a fine pencil cross on the ground surface of the screen and sliding the eye-piece in its tube until the cross appears quite sharp. A line should then be made on the tube, so that the exact position can be obtained at any time. It will be noted that it is difficult to see the image at the corners of the screen owing to their oblique direction, and some glasses are therefore made with a pivotted base, so that they may be so placed as to catch these marginal rays more or less end on. It is desirable that the eye-piece should possess as little chromatic aberration as possible, as it is difficult to focus fine detail if it is surrounded with color fringes, which is often the case when using cheap single lens magnifiers. Occasionally, screens are provided

with clear patches, either by being left unground or by cementing microscopic cover glasses upon the ground surface. This is supposed to facilitate fine focussing, but in my opinion, in the majority of cases, it is more likely to lead the operator into error. Most people of moderate age have a considerable power of "accommodation" in their eyes, and the aerial image will appear sharp when it is some distance from the plane of the focussing screen. There is only one method of focussing with a clear glass screen, by which this error may be avoided, and that is by fixing a small square of tinfoil or other thin opaque substance on the face of the screen. The eye-piece is placed so that one edge of the square bisects its field and the object to be focussed is brought into such a position that a readily recognizable point falls upon this edge. The focus is now carefully obtained, and then the eye-piece is moved up and down. If the image appears stationary, it is focussed correctly on the surface of the glass, but if it appears to dodge up and down behind the tinfoil, then another trial must be made.

It is desirable in all cases to focus by a gradual to-and-fro movement of the camera back or front, coming to rest slowly much as the index of a chemical balance does when weighing a light load. This is especially desirable when using a lens which is suffering from slight spherical aberration, which makes it difficult to select the sharpest position. With such lenses it is necessary to focus with the aperture with which the exposure is to be made as the focus is altered if the aperture is afterward made larger or smaller.

Aids to focussing are often very useful, the commonest being a candle or other flame to assist in determining the limits of the subject and obtaining sharp definition when working in dark interiors, and a finely printed or engraved card, which is used when copying any badly defined object such as an oil painting with no definite outlines or an unsharp photograph. If the card—an ordinary visiting card answers well—be placed on the surface of the original and sharply focussed, the copy will possess all the sharpness which existed in the original. Different types of lenses require different treatment to secure the best results. As a rule, rectilinears and other round-field lenses give the best average sharpness when focussed midway between the center and the edge of the field, unless the subject is one which lends itself to the natural curvature of the field. With most anastigmats it is best to secure the greatest sharpness in the center, as the margins will then frequently appear sharper in the negative than they looked on the screen. With all types of lenses great assistance can be given by a judicious use of the swing back, both vertical and side movements being employed as needed. In portraiture especially a much larger aperture may be used if the back be swung so as to accommodate the position of the sitter, but it should be remembered that with a short focus lens there is always the danger of making the hands and feet of a sitting figure disproportionately large if the use of the swing back is overdone.

Focussing with telephoto lenses, especially

those of high power, is a somewhat delicate proceeding. As the result of considerable experience in this branch, I would recommend that the bellows should be extended to the requisite distance to obtain the desired magnification, and that the focus should be obtained by the rack adjustment of the telephoto tube. If the extension be too great for the pinion head to be reached by the hand, a Hooke's joint handle must be used. This is a sort of winding key which fits on the pinion head and is attached to a long rod by a peculiarly shaped double link, which allows it to be rotated in any position, even at right angles if necessary. A clear patch on the screen is very convenient when working with telephoto lenses, as the illumination is usually feeble, and it is much easier to get an approximate focus on the clear glass, examining it afterward more critically on the ground portion. Also in the case of there being any chromatic error, it is easier seen through the clear glass. If such error should exist, the best position to leave the image at is when any brilliant white spot in the subject is surrounded by an orange fringe. This will give a practically sharp outline, but if the same point be focussed to show a blue fringe the result will be fuzzy.—*British Journal of Photography.*

Fixing and Washing

THERE is no need to be in a hurry about taking negatives or prints out of the fixing bath. They are not injured by being left a good deal longer than necessary, provided the bath is fresh.

The fixing bath contracts the gelatin emulsion and expels the water from the pores, thus leaving the gelatin drier and harder than it was when fixing began. On the other hand, prolonged washing in water that is slightly warm softens and swells the emulsion and may cause frilling and other similar troubles.

In warm weather, negatives are better for prolonged fixing and comparatively short washing. If the fixing bath is fresh, negatives may safely be left in it for half-an-hour, even though fixation may apparently be complete in eight or ten minutes. If negatives are thoroughly fixed in this way, they will not need to be washed for more than twenty minutes in running water. This method of working not only gives more satisfactory results but is actually quicker than the usual method of fixing for ten or fifteen minutes and washing for an hour.

Prints, of course, must be given a longer washing than plates.—*Professional Photographer.*

A Hint on Bromide Printing

IN spite of all the photographic knowledge acquired in recent years, very little is really known about the latent image. Investigators have never been able to come to any decision regarding it. They expose a plate or a print, and they know that they have created this latent image and that it can be developed, but that is about as far as their actual knowledge goes.

Still, there are certain peculiarities concerning it which the regular photographer very soon finds out by experience. He soon gets to know, for instance, that, in printing on bromide or gas-light paper, this latent image is liable to deteriorate if the paper is laid aside for some time before being developed.

When prints are exposed one day, and not developed until the next, they are apt to appear very much underexposed. This does not always happen, but it happens so often that the professional cannot afford to run the risk of spoiling a batch of otherwise perfectly good prints.

Deterioration of the latent image is most noticeable when exposed prints have been left in a damp place. Even an hour or so in a moist atmosphere is often long enough to make a decided difference in the quality of the developed print. Prints left during lunch time have been known to show unmistakable signs of deterioration. Printers who are not aware that the latent image is liable to behave in this way often conclude that the paper of a certain emulsion is not uniform in speed. They blame the manufacturer for something in his paper which is common to all papers, and for which there is no known remedy.

Strangely enough, this trouble is not met with in plates and films unless they are left for a very long time before being developed. It is met with in paper so often, however, that, until the erratic nature of the latent image is better understood, professionals would be well advised to develop prints as soon as possible after exposure, and to keep a dry atmosphere in their printing rooms.—*Professional Photographer.*

Large Heads Direct

WHEN an operator starts taking very large heads direct, he is liable to fall into the error of using a lens of too short a focus. He finds that as fast as he gets one feature in focus another goes out of focus, and no compromise is possible except to produce a fuzzy negative which is sharp nowhere. He learns after a few failures, however, that a long-focus lens is absolutely necessary for this class of work if he wants definition and absence of distortion. Another frequent error in making large heads is under-exposure. This causes the harshness which is so fatal to good results. It makes slight blemishes or freckles too assertive, and prevents the shadows from being luminous. To secure softness and gradation in the flesh, the exposure must be full, and development must not be prolonged or forced. It is a wise precaution to keep the developer weak in pyro.—*Professional Photographer.*

Cleaning, Renovating, and Re-mounting Photographs

THE photographer is often called upon to make the best of a photograph which is not in its state of pristine freshness usually for the purpose of copying, but sometimes for re-mounting and framing only. It is hardly necessary to remind a man of business ability that it is much better to secure an order for copying

when possible, and to this end it is a good plan to have ready for instant production a rather disreputable-looking original and a very excellent reproduction of it. However, the question is the restoration of deteriorated photographs, no matter what their ultimate destiny is to be.

The simpler the treatment which can be applied the safer and the more likely to be successful. Some writers recommend chemical treatment to restore vigor to a faded print, but it is a risky business. One never knows what the exact condition of a print is and how it will behave on being intensified, which is practically what has to be done. It must always be remembered that an exaggerated value is usually placed upon an old photograph by its owner, and that an unsuccessful attempt at restoration will result in a loss of reputation, which is many times worse than the loss of any profit which might be made upon the job. Hence I counsel that the greatest caution be exercised in dealing with customers' prints, and that rather too little be attempted than that any risk of injury be run.

Before trying any other method of restoration, the first thing to be done with a print, no matter by what process it may be made, is to get rid of what may be termed adherent dirt—that is to say, dirt which cannot be removed by gentle friction with a soft rag or, better still, a pad of cotton-wool. This is best effected by gently dabbing the surface with a fair-sized lump of stiff dough. I got the idea of this from watching a paper-hanger clean a wall which was so dirty that the pattern on the paper was hardly visible. He took a lump of stiff dough and dabbed it on the paper until it lifted the dirt, and if it did not restore the original whiteness, made what was nearly black appear as a very light gray. The dough must be spread out and folded over as the surface becomes soiled, until the whole mass is too dirty to be of further service. This, however, is hardly likely to occur when cleaning photographs. The dough is made of a cheap quality of flour (which is more glutinous than "pastry whites") mixed with cold water and kneaded until it does not stick to the fingers. If too wet a little more flour must be added until the mass is elastic and quite clean to handle. This dough may be used with safety upon any print, silver, carbon, platinum, or bromide, and will often be found to do all that is necessary. With albuminized prints, which are usually covered with fine cracks, it is especially good. If any liquid be employed the dirt is washed into the cracks, and the last state of that print is worse than the first, but the dough just lifts the dirt and lifts it out of the cracks as well as from the surface.

After this treatment we must consider any obstinate defects. These are possibly due to grease, and in such case there is nothing better than a liberal application of benzole, or even of ordinary petrol or motor spirit. This will remove grease with any dirt which may be incorporated with it, and will not injure any print made by the processes in general use. Naturally, oil prints or Bromoils must not be treated with petrol or any similar liquid or the image will be totally destroyed.

The process by which the print is made naturally influences the treatment which may be applied. Bromides are among the first to show deterioration and require the greatest care in their renovation. There is frequently a surface tarnish which imparts a metallic appearance to the shadows, and this is best dealt with by friction with a pad of cotton-wool and a little metal polish, such as "Globe." This will rapidly remove the tarnish, but should be followed by a careful cleaning with petrol or benzole to remove any traces of the polish. A coating of white wax dissolved in benzole or turpentine will restore the surface and prevent reappearance of the tarnish for a considerable period.

Carbon prints give little trouble. As a rule, a wash with petrol or a rub with a pad charged with turpentine and wax will remove all dirt and give a fresh appearance. Carbon prints are easily cleaned; a pad of cotton-wool moistened with turpentine or benzole will immediately remove any dirt. It is necessary to avoid using any bleaching liquid with these, as chloride of lime or any similar compound not only renders the gelatin soluble, but may alter the color of the pigment. I have found the Globe metal polish useful for cleaning bromides and carbons, very obstinate stains giving way to it. Too much friction must be avoided, or the image will be affected—in fact, it is possible to reduce a bromide locally in this way; but there is always a tendency for a granularity to appear. Platinum prints are more delicate subjects, and will not, as a rule, stand any friction. In most cases the dough treatment will be sufficient, but if there be a considerable amount of yellowing a clearing bath of hydrochloric acid may be found necessary. If the stain does not yield to the acid, a bath of diluted "eau de javelle" will usually answer. It is necessary to be very cautious when using this, or a weak solution of chloride of lime, as there is a tendency to rot the paper. Immersion in a 5 per cent. solution of hypo will neutralize the chlorine and will not injure a platinum image. Naturally, the print must be removed from its mount before treatment. Platinum prints are easily damaged by friction, so that only the margins should be cleaned with rubber or eraser. Even a too vigorous rubbing with bread crumbs will remove the more delicate tones.

Bromide and other gelatin surface papers are often greatly improved by gently rubbing with a pad of cotton-wool moistened with methylated spirit. This will usually remove the tarry film which is deposited when a photograph is kept in a smoky atmosphere. Benzole or motor spirit may be substituted for the spirit, but, owing to their extremely volatile nature, are not so convenient to use. A soft eraser may be used on matt surface bromides, and for small obstinate patches the small glass brushes sold for erasing typewriting answer well. Collodio-chloride papers, which include many of the self-toning variety, must not be touched with spirit, or the image will be destroyed. The dough treatment is usually sufficient, as the surface is not absorbent.

Most prints are improved after cleaning by being treated with a little waxing compound, or

caustic paste, as it used to be called. White wax dissolved in turpentine or benzole to the consistence of pomatum answers as well as the commercial article. This should be rubbed on sparingly with a tuft of cotton-wool and polished off with a soft silk or cambric rag. Usually any spotting or working up is removed in the process and cleaning and must be replaced before the final waxing.

Colored work requires delicate treatment, and it is hardly possible to do more than to rub very gently with fairly dry breadcrumbs, desisting if there is any sign of the color moving. The margins may be cleaned with dough or rubber.

With regard to re-mounting, I strongly recommend, if possible, this should be avoided, and that the print should be placed under a cut-out, either of card or paper. If the thick cut-out be objected to, a mount may be made of white or tinted drawing paper and pasted over the original card, an opening being previously cut to fit the print. This can be done very neatly by using the dry-mounting tints which have one side already rendered adhesive. Sometimes the re-mounting question may be settled by abolishing the margin altogether and framing close up. A very dingy-looking print can often be made to look presentable by framing in a rather heavy dark oak or black moulding.

Unmounting is a ticklish job and is always attended with some risk. Many prints which have endured fairly well rapidly deteriorate after they have been wetted. There is no better way than to lay thick wet Robosal blotting boards between the prints and to put the pile under light pressure for twenty-four hours; if they will not lift, damp the blotting-paper again and put by till next day. If they are still obdurate nothing can be done but to split the board until it is thin enough to be penetrated by moisture from the back, when the mountant will generally soften; but in some cases the print will have to be laid face down upon a glass and the mount rubbed away with the fingers. It is often possible to remove a print from the mount without wetting by splitting the card until it is quite flexible; then the print must be laid face down on a smooth surface and the mount torn off. If the print is kept flat only the mount will tear, but if you attempt to pull the print off the mount the print will tear. It is quite easy to remove a fragile postage stamp from a tough manilla envelope by observing this principle. Any small portions of adhering mount should be removed with very fine glass-paper and the print dry-mounted upon the new card, if possible.—*British Journal of Photography*.

Avoiding an Old Trouble

A PRINTER complained recently in the correspondence column of a photographic magazine that, in spite of using a very great excess of bromide in the developer, he couldn't get clear high-lights in his bromide prints. This is a common trouble with inexperienced printers, and the cause is generally attributed to faulty paper or unsuitable developer. The old hand does not need to be told, however, that, when bromide paper is not stale and has not been

fogged by careless handling, degraded whites, when they occur with such an excess of bromide in the developer, are due to overexposure and to nothing else.

There is always a tendency in bromide printing to over-expose and cut short the development. It is often done deliberately with the object of saving time in turning out a big batch of prints. This causes more failures than all other causes put together. It produces degraded, granular prints of a rusty greenish-color, utterly useless for sepia toning, and equally useless for black and white.

It is quite true that many well-known exhibitors who print on bromide can get some very pleasing effects by playing all sorts of tricks with exposures and developers, but the regular worker who has to turn out batch after batch of prints, and has to keep them uniform in color and quality, can maintain a high standard only by working according to some plan which has been proved to be the most satisfactory for all-round work.

There is only one way of maintaining an output of perfect bromide prints, and that is to expose correctly and develop to the utmost. The temperature of the developer should be between 60° and 65°, and should contain the minimum quantity of potassium bromide required by the paper—usually one or two drops of a 10 per cent. solution to each ounce. It is only when development is complete, or almost complete, that the image in bromide prints reaches its proper black color and its correct gradation. At any stage short of this the color and gradation are inferior, hence the impossibility of getting perfect prints by overexposing and stopping development half-way.

Full development, after all, is no great hardship. With an average Enol-Hydroquinone or Dolmi developer at a proper temperature, the average time for bromide paper is from 1½ to 2 minutes.

The golden rule is: Get the exposure right, watch the clock and the thermometer, and the prints will look after themselves.—*Professional Photographer*.

Reflex Cameras in Professional Work

THE average professional photographer has never taken kindly to the reflex type of camera. I know of more than one who has gone as far as purchasing such an instrument, only to keep it on the shelf after a few trials. The fact is that such people expect too much from an instrument which is of inestimable value for special work, but has many shortcomings when compared with a stand camera for ordinary work or with one of the collapsible type for what are generally termed snap-shots. The true function of the reflex is to ensure accurate placing of the subject upon the plate, combined with absolute sharpness of definition in circumstances when it is impossible or undesirable to use a stand camera. The greatest amount of benefit cannot be obtained without a little study and practice, and I would recommend anyone who acquires a reflex camera to use it as an amateur for a while on subjects which are of no impor-

tance from a commercial point of view until all the necessary manipulations can be performed with perfect ease and confidence. It is taking a strange camera on an important job and getting the focal plane-shutter jammed which makes one resolve to go back to the old stand camera and to stick to it, although it will mean passing many subjects which could easily have been secured with the aid of the reflex. Let us consider the general advantages and disadvantages of the reflex system before dealing with any of its special applications.

Its first good point is mobility. The operator is not limited in his choice of positions to places where it is possible to put a stand. This merit is, of course, possessed by a five-shilling Brownie, but not by the best stand-camera made. Next we have an absolutely correct centering of the image upon the plate, the great point with a stand-camera, but one which is absent with even the best hand-cameras fitted with small finders. I have worked with nearly every type of hand-camera from five shillings to fifty pounds, but I have never found one that you can depend upon within a quarter of an inch in a half-plate unless it was a reflex. The greatest advantage gained by the use of the reflex is the absolutely correct focussing which is ensured. It is given to few persons to focus correctly by scale when using, say, a nine-inch lens working at $f/4.5$, but with the aid of the mirror it is the easiest thing in the world; in fact, the larger the working aperture of the lens the easier it is to get a sharp image. For this reason the reflex is invaluable to the photographer who only occasionally uses a hand-camera and does not acquire the knack of focussing by scale, which most Press photographers seem to possess.

The disadvantages of the reflex are, first, its considerable bulk and weight; a half-plate, the most useful size, is rather heavy to carry and clumsy to handle. Secondly, slowness in action; rapidly moving subjects often may be missed during the time lost in raising the mirror. Thirdly, lack of sufficient range of rising front and an absence of swing-back; these shortcomings preventing its effective use as a stand camera. Another drawback with most (not all) of the shutters is the absence of long "instantaneous" exposures, say, between $\frac{1}{4}$ and $\frac{1}{10}$ of a second—just the speeds required for photographing animals and children. Moreover, in many cases there is far too much noise in working. One I handled the other day suggested at each exposure that the whole instrument was coming to pieces.

Child portraiture is the field in which the reflex camera will be found most useful by the professional, and especially by one who has previously found this work to be a weariness of the flesh, since by its means the great problem of keeping the sitter in position between the time of focussing and exposure is practically solved by reducing that time to the minimum. Another advantage is gained by convenience in focussing, as the camera can be placed as low as may be necessary while the operator retains an erect position. Personally, I do not believe that however fond a man may be of children he enjoys going down on his knees to focus their portraits.

Although it is very desirable to have the camera fitted with an extra-rapid anastigmat, it is by no means necessary for studio work, as any lens which can be fitted upon the front and is of sufficient focal length to allow the mirror to rise may be used. There are many excellent eury-scopes and similar types with focal lengths of ten to twelve inches which answer admirably, while some cameras will even accommodate such portrait lenses as a Dallmeyer 3B or 2A. Of course, these are for half-plate work. For quarter-plates a Dallmeyer 2B or Ross C.D.V lens is very useful. A little ingenuity is sometimes needed in fitting these large lenses, but that it can be done I can say from actual experience. An extra front panel will permit of the camera being used for outdoor work with more suitable lenses.

The reflex camera is even more indispensable for animal portraiture than for the human sitter, for in most cases the work can be done out of doors and quicker exposures may be given. The absence of the focussing cloth and of the motions necessary for removing the focussing screen and inserting the dark slide are also advantages, as the attention of the animal is not drawn to the camera until all is ready for exposure. When photographing horses, the low viewpoint necessitated by the reflex is usually bad, and the operator should avail himself of the elevation afforded by a chair or other stand, so as to bring the lens to the height of the eye of a person standing on the ground. Quite a false impression may be given by taking a picture from the level of the stirrups, and yet the cause may be unsuspected. The owner, who is usually an expert, knows that the picture is not right according to his ideas, but usually does not know what is the reason. The smaller the animal the longer the focus of the lens should be. Toy dogs, guinea-pigs, rabbits, pigeons, or the like must necessarily be taken at short range, but this should not be shorter than need be. It is better with such subjects to get a small, perfectly sharp image and enlarge to the desired size. In fact, if this plan be pursued throughout, most of the disadvantages of the reflex camera disappear, as a quarter-plate instrument may be used, and with a fixed-focus enlarger there is little more trouble than with contact printing.

Coming to construction, I would in the first place recommend the selection of a camera with a shutter which does not profess to give an extremely long range of exposures, the adjustments being complicated and the results uncertain. A speed of $1/500$ of a second is quite great enough for all practical work, and it is possible to secure from this down to $1/10$ th second by adjustment of the slit only. A quick wind device should be provided, and it is very necessary that a given exposure can be repeated without having to set to the desired speed each time. The outer covering of the shutter should be removable, so that in case of any jamming occurring in the gear work it may be remedied without returning the camera to the makers. Small chips of wood or splinters of glass will often put a shutter out of action, and I have before now had such a thing happen through a dry leaf blowing in while working. As my camera was

of the get-at-able sort, I was able to be at work again in five minutes. It is very unwise to carry the ground glass focussing screen supplied for stand work in the groove provided for the slides. If it gets broken there is every probability of some glass splinters getting into the shutter, causing a serious risk of injuring the gear and cutting the blind. Therefore always carry the screen in the slide compartment and have a slide in the back of the camera to protect the blind. Every reflex used for professional work should be fitted with a reversible back. The horizontal form enables a great saving in bulk and weight to be effected, but when figure work has to be done it is better to put up with these rather than be handicapped by having to turn the camera after focussing. Unless the photographer be very short sighted a pair of magnifiers should be fitted into the hood. These allow the eyes to come close to the aperture, thereby keeping out stray light. They also permit of the use of a shorter hood and consequently of a slightly higher point of view. Minor points that should be regarded are the accessibility of the ground glass and mirror for cleaning, silence in working, and convenience in focussing. If possible, choose an instrument in which the mirror works independently of the shutter. The worst pattern is that in which the mirror flies up with a bang and lets off the shutter at the moment the shock occurs. In the case of a second-hand instrument an extended trial should be allowed. It is better to hire for a month with the option of purchase than to buy with the option of getting the camera exchanged or the money returned. Dealers vary much in the readiness with which they comply with such requests.—*British Journal of Photography.*

Pointers

GROUND cuttlefish and resin mixed in equal parts make a very good powder for rubbing down an over-dense part of a negative. The best way to use it is to take some of the powder on the finger-tip and rub with a circular motion on the part to be reduced. If the part is too small for this method, use the powder on the point of a paper stump. For large spaces, where more friction can be used, fine pumice and the finest grade of emery mixed together make a very good powder. The emery should be the grade used by opticians and jewelers.

THERE are operators who never use a reflector. They claim that reflected light destroys the modeling of the face, sets up double "catch-lights" in the eyes, and adds considerably to the work of the retoucher. On the other hand, there are many who always use a reflector. These claim that it relieves the shadow side of the face, softens the contrasts and shortens the exposure. There are sound arguments on both sides; sounder arguments than those of either side, however, can be advanced by the man who knows what he wants and is determined to get it by any means possible—the man who uses a reflector when it helps him, and discards it when he can get the effects he wants without it.

HERE is a formula for a good dextrine mountant: Best white dextrin, $2\frac{3}{4}$ pounds; water, 80 ounces; oil of wintergreen, 15 minims; oil of cloves, 15 minims. Mix the dextrin into a thick cream with a little of the cold water, taking care to break up all lumps. When this is done, heat the remainder of the water to 180° F., add it slowly to the mixture stirring vigorously all the time. This should make a perfectly smooth, transparent liquid which should be kept hot, very nearly at boiling point, for ten minutes. After this add the oils into pots.—*Professional Photographer*.

Hands

THE more you try to pose hands the more likely you are to get into trouble. Never call your sitter's attention to them—this spells certain ruin to a good pose. Hands, like children, often become unruly when they have nothing to do, and they will very likely become awkward when they are required to do something to which they are not accustomed. When it is in keeping with the nature of the picture you are making, try to have the hands doing something natural.

When a hand is unoccupied the sitter is so conscious of it that it becomes an encumbrance rather than a help. Giving the hand something useful and natural to do avoids this. The hands may be used with good effect as a support for the body.

Given an opportunity, the average man will rest his hand on or grasp something if he is standing, not because he thinks he is going to fall over or imagines he is in a street car, but because it is natural for the hands to be occupied.—*Photo Digest*.

PATENT NEWS

Under this heading it is proposed to include each month a list of all the U. S. Patents; and brief extracts of the more important, and to include also such foreign patents as present special features.

Copies of any patent can be obtained from the Commissioner of Patents, Washington, D. C. Price, five cents each.

Patent Photo Printing Machine. F. L. Stuber. 1223217.
Apparatus for the Production of Photog. Negatives. E. H. Farmer. 1231581.
Vault-Light Lens-Holder. E. J. Alfieres. 1231688.
Light Dividing Means for Optical Apparatus. D. F. Comstock. 1231710.
Screen for Projecting. L. Gaumont. 1231727.
Apparatus for Retouching Negatives. J. Horak. 1231740.
Camera-Shutter. C. E. Grenell. 1231878.
Film Case. E. A. Ruppert. 1231945.
M. P. Apparatus. R. K. Snow & A. B. Perdue. 1231958.
Cinematographic Device. E. M. Stoffels. 1231961.

Dissolving Stereopticon. A. F. Victor. 1231974.
Projection Lamp. K. Kleibert. 1232046.
Process for Quick Drying of Cinematog. Film, etc. E. Planchat. 1232077.
Camera. A. L. Tripell. 1232125.
Photographic-Printing Device. W. Allen. 1232164.
Photographic-Printing Machine. J. A. Chadderton. 1232219.
Automatic Exposure-Spacing Machine for Roll-Film Cameras. E. G. Ervin & F. C. Smith. 1232254.
M. P. Machine. Jeremiah Keller. 1232326.
Intermittent Gearing for M. P. Machine. J. Keller. 1232327.
Framing Device for M. P. Machine. J. Keller. 1232328.
Focussing Device for Cameras. C. B. Knott. 1232333.
Method of Producing M. P. Films. L. Miller. 1232359.
Film-Cutter for M. P. Cameras. Carl E. Akeley. 1232418.
Axis-Finder for A Lens. C. Milgrom & D. Dunn. 1232466.
Forming, and Transparency for Producing, Colored Projected Images. D. F. Comstock. 1232504.
Retouching Device for Photographic Negatives. J. R. Mettler & G. M. Lafoon. 1232589.
Photographic Film. F. W. Lovejoy. 1232702.
Light-Varying Apparatus for Printing Mechanism. P. F. Sperry. 1232727.
Attachment for M. P. Reels. L. S. Baluta. 1232753.
Shutter for Photographic Devices. L. P. Carhart. 1232768.
Automatic Film-Shifter for Cameras. R. H. Moore & R. P. Saffold. 1232828.
Film Insertion Device. B. M. Dickson. 1232900.
Camera Attachment. C. G. Tanquary & W. J. Caldwell. 1232993.
Stop Mechanism for Camera Fronts. C. M. March. 1233095.
Apparatus for Developing or Intensifying Photog. Plates. L. D. Nesbit. 1233109.
X-Ray Apparatus. E. Pohl. 1233122.
X-Ray System. H. C. Snook. 1233137.
Apparatus for Printing Cinematog. Films. P. D. Brewster. 1233176.
Portable Dark Chamber. A. Benko. 1233441.
Segment for M. P. Shutters. E. W. Clark. 1233186.
Lantern-Slide Carrier. F. Schwanhauser. 1233407.
Shutter for Camera-Lenses, Espec. for Studio-Cameras. J. P. Hansen. 1233571.
Cinematograph for Projection in Nat. Colors by the Three-Color Process. L. Gaumont. 1233772.
Shutter for M. P. Machine. C. R. Smith. 1233816.
Film-Indicator. M. A. Godwin. 1233868.
Automatic Film-Winding Mechanism for Cameras. L. K. Strate. 1233929.
M. P. Film. P. J. Landin. 1234046.
Photographic Shutter. L. J. Marks. 1234061.

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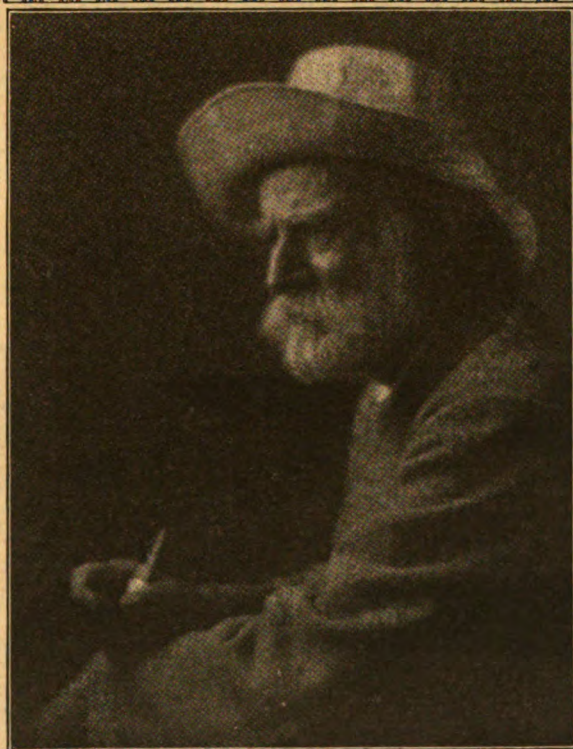
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C. Crowther, Kobe, Japan

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PORTRAIT PHOTOGRAPHY AS A BUSINESS

By JOHN A. TENNANT

WHETHER portrait photography can be considered a lucrative business, yielding a fairly profitable return for intelligent service, is the question proposed here for discussion.

Like every other question, this one has at least two sides: That of the photographer devoted to a business of which the ultimate profits belong to himself, and that of the employé whose service brings him a periodical remuneration which, like a chemical price-list, is "subject to change" and has no essential relation to the profits of his employer's business. Wherefore, it may happen that the views of one who has looked practically at each side of the question in turn, and is now, happily, able to regard them both retrospectively, as an impartial outsider, may be suggestive.

If there is one fact more evident than another to the observant photographer of today it is that the public, upon whom the photographer depends, is of two minds regarding portrait work: Either

it wants portraiture at a low price regardless of quality, or it seeks quality in a measure regardless of the price asked for it. The lot of the mediocre workman, hopeless in almost any profession, becomes daily more and more desperate in photography. To our shame be it confessed, there are among us more mediocre photographers than either good or absolutely bad photographers. The business career of such a photographer is a pitiful struggle. The "cut-rate" and "coupon" worker, with his organized facilities for producing work of a superficial quality at a low price, harasses him on one hand, while on the other hand the capable and enterprising photographer, confident of his power and knowing the value of his work, takes away the best patronage of the locality. Placed thus, "between the devil and the deep sea," the mediocre man looks back with envious eye to the position where he turned out his couple of hundred prints a day, and was

(403)

always sure of his salary at the week's end, and realizes by experience that his last state is worse than the first.

There is a common-sense hint in these facts well worth the attention of the young photographic employé: However natural the ambition of the employé to enter upon business for himself, he will, if he is wise, consider well whether he is possessed of sufficient skill to enable him to take and hold his place among thoroughly capable workers and take that share of the appreciation which falls only to such as are exceptionally skilled in their work; or, on the other hand, whether it would not honestly be to his advantage to remain an employé and content himself with whatever remuneration his competence can secure. There is "room at the top," and money too, among employés as well as among employers.

As one having exceptional opportunities to observe the conditions which the majority of American photographers have to face in these times, I have no hesitation whatever in venturing the opinion that at least one-third of our photographers would be in more prosperous circumstances today had they improved their possibilities as employés instead of rushing heedlessly into business for themselves, and so creating such keenness of competition that, with their restricted capabilities, there was left to them scarcely the slightest prospect of success. Discouraging though this may seem, it cannot be too strongly impressed upon the young photographer who is fondly contemplating the near prospect of getting into business for himself, that for many years to come there are better and brighter chances for him as a thoroughly skilled employé than he could hope to reach in a gallery of his own.

Turning now to the photographer already in business for himself, to whom the opinions expressed contain little of interest, let us consider the obstacles which prevent him from making a success of portrait photography as a

business. The only answer I have yet received from photographers whom I have questioned as to *the* weak point of their business, is "prices." This universal complaint has been discussed again and again at conventions, always ending unprofitably, as it deserves to end. The complaint is not an honest one; it is the cry of hypocrisy shrinking from the admission of the true complaint—*bad work*. Let any one, who honestly doubts that bad work is the real cause of the decay of portrait photography as a profession, take an hour or two and carefully examine the work of low-price photographers, and, if necessary, look into his own work also, comparing all he sees with the work of men who obtain good prices, and he will find, if he is sufficiently frank with himself, that the low-price man, generally speaking, is getting more than his work is worth, considered as portraiture. I have been amused, and yet astounded, at our conventions, after listening to violent speeches about "prices" as the cause of the photographers' woe, to see the speakers pull from their pocket a bundle of photographs, examples of their work, of such poor quality as to be hardly worth the paper on which they were printed. There is no mystery at all about "prices," nor has this word anything to do with the want of success with the average photographer; his *work* is his curse; when he improves that his trade will improve also, and in proportion to his earnestness along this line of improvement he will cease to have cause for complaint. Let the photographer look carefully to his *work*, the "prices" will take care of themselves.

It is almost unnecessary to add that in the improvement of his work the photographer will not only clear away the greatest obstacle to his success, but he will also find that the answer to the question, Is portrait photography a profitable business? depends entirely upon the *quality* of the work as portraiture.

THE PRODUCTION OF SEPIA TONES BY DIRECT DEVELOPMENT¹

BY ADOLPH NIETZ AND KENNETH HUSE

THE observations recorded in the following paper were made in order to find the best conditions for producing sepia tones by the use of a restrained developer for a fully exposed print. It is well known that slow developing-out papers, such as Velox or Artura, will give warm tones if over-exposed and developed with a strongly restrained developer, and some years ago instructions were given for obtaining warm tones on Velox paper by this method.

The process, however, has not come into favor in consequence of the uncertainties attending its use and we do not expect that the production of sepia prints by this method is very likely to be generally adopted. At the same time the results obtained in our work were very interesting and with some subjects very excellent prints can be obtained. Great care in manipulation is necessary, as there is little margin for error, so that the working of the process is not by any means easy.

In an attempt to standardize the conditions under which the best tones could be obtained we found that the tone depended only upon the time of development, and that with a fixed time of development a good reproduction of tone could be secured, the exposure being adjusted to get the necessary depth of print. We have also found that developing agents vary considerably in their suitability for use with restrainers, and have found that only one or two developers give really first-class results, and that one of these in particular is especially suitable for obtaining good sepia tones free from smokiness in the shadows, which was the disadvantage of earlier methods of obtaining warm-tone prints by restrained development.

This process about to be described is particularly suitable for obtaining true

sepias, a true sepia being defined for this purpose as corresponding to the sepia water color manufactured by Winsor and Newton. Since in development the print starts as a red-brown and passes through brown, sepia-olive, sepias, and olives, any of these tones can be obtained under conditions which will be stated later.

The Paper to be Used. Artura chloride is the only paper with which we have obtained really satisfactory results, and it is to be understood that all subsequent statements imply the use of this printing material.

Developing Agent. The most satisfactory developing agent was found to be chlorhydrochinon. A great number of other developing agents were tried, including hydrochinon and elon and other substituted hydrochinons, but chlorhydrochinon has the necessary properties for use as a restrained developer; it is sensitive to restraining agents, it works cleanly and is stable, and we have therefore adopted it for obtaining these sepia tones.

Effect of Constitution of Developer. After numerous experiments the best working formula was found to be:

Chlorhydrochinon	5 gm.
Sodium sulphite	30 gm.
Sodium carbonate	16 gm.
Potassium bromide	6 gm.
Potassium metabisulphite . .	6 gm.
Water to	1000 c.c.

With this as a basis a systematic study of the effects of each constituent was carried out.

Developing Agent. Alterations in the amount of developing agent gained no advantage.

Sulphite. Changes in the concentration of this substance had practically no effect on the resultant tone.

Carbonate. As the developer is inert in the absence of alkali a certain amount is necessary to obtain a solution which

¹ Communication No. 53 from the Research Laboratory of the Eastman Kodak Company.

will work at all rapidly with such large concentrations of bromide and metabisulphite as are necessarily present. The following considerations will show the important part taken by alkali in this process. The color of the resultant print depends solely on the size of the silver grains in this case and not on the formation of any colored oxidation product. As development progresses these grains grow in size and hence the effective color changes successively through a range from red to greenish brown and to black. Therefore, at any particular stage, the color must be due to a combination of these various grain sizes, since some of the grains start developing at a later time than others. Thus a proper mixture of greenish black with red produces the desired sepia. This balance of grain sizes, depending on the speed with which development proceeds, is necessarily dependent upon the concentration of alkali used. It was found that the concentration given in the above formula was a critical one, as a less amount rendered the developer entirely too sluggish, while more hastened development so materially that the tone was destroyed. Potassium carbonate was substituted but was not found as satisfactory. This may be due to the fact that in equivalent quantities it is somewhat more alkaline than sodium carbonate. It is also doubtful whether the resultant color was as good.

Potassium Bromide. This may be considered one of the most important constituents. After trials of a wide range of concentrations of bromide about the amount indicated in the formula was found necessary and sufficient to aid in producing the proper tone. An excess needlessly lengthened the exposure and the time of development required. As the proper size of grain can be produced only in restrained development, a low concentration of potassium bromide is obviously detrimental to the tone.

Potassium Metabisulphite. So far we have given no reason for the use of this substance, which usually does not appear in formulae for paper developers. It was in attempts to increase the keeping power of the developer that this substance was first used. In relatively large quantities

it was found to exert considerable restraining action and to influence the color to a great extent. It is probable that the action of metabisulphite is not exactly similar to the restraining tendencies of bromide. This is borne out by the fact that satisfactory sepias cannot be obtained without this compound, although reds and yellows, such as those characteristic of ordinary restrained development, are easily produced by the use of bromide alone. The greatest factor in the production of correct tone apparently is a delicate balance between the concentrations of bromide and metabisulphite, which seem to be interdependent and capable of producing certain tones not obtainable by other methods. The amounts given in the formula are about correct; more metabisulphite renders the tone too red, whereas less gives greenish black tones.

Aside from the changes thus far described, numerous experiments were made altering two or three constituents at the same time, or omitting any one or two. In this manner more than one hundred developing formulae were tested, but not one of them showed any improvement over that already given.

Dilution of the Developer. The considerations on the speed of development and its relation to color, brought out in the paragraph relating to sodium carbonate, are applicable here. Accordingly if the developer is diluted the speed of development is decreased and the size of grain diminished, with a tendency toward more color in the print. Naturally if dilution is not great practically the same results may be obtained by longer development as with the more concentrated solution. However, nothing is gained by changing the concentration of the developer, since the time of development with the formula stated is conveniently short but sufficient to permit of control.

Time of Development. That the tone is dependent only on the time of development is indicated by the fact that the print changes continuously in color from the beginning, passing through the stages yellow, yellow-brown, red-brown, sepia, to greenish-black. Hence it is

evident that, to obtain any warm tone, it is absolutely necessary to stop development at a definite time. But the time of development having once been determined, any number of prints may be developed to the same tone. The actual time ranges usually from one to two minutes, which is no more than that necessary for ordinary development. This step of the process requires some experience and skill. It is impossible to judge by the depth of the print at which point development should be stopped. The print fades considerably and also changes color in the fixing bath, again changing color and depth on drying. It is therefore imperative to develop equally exposed prints for different lengths of time, thereby securing different tones, and to complete the operations of fixation and drying before final selection is made. The proper developing time is then chosen and all succeeding prints must be developed for that time. However, these statements apply only to a limited extent; it will be shown later that the tone obtainable varies somewhat with the character of the subject and the contrast of the negative. Other conditions to be carefully observed will also be considered. Nevertheless, under any given set of conditions, a definite tone is obtained by maintaining a constant time of development.

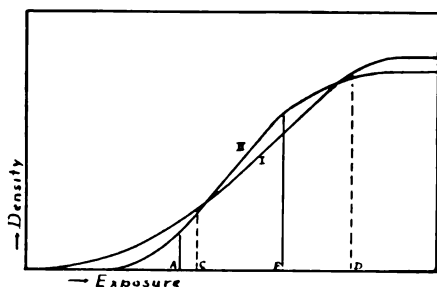
Exposure. At first glance it may appear that the length of exposure required is excessive, since this is of the order of 75 to 100 times normal. As Artura chloride is itself a slow paper—with ordinary light sources the time of exposure becomes so long as to be impractical—but the arc lamp, the mercury vapor, or the nitrogen tungsten light reduces this exposure to fractions of a minute. An indication of approximately correct exposure is a slight printing-out of the image. The character of the negative may somewhat affect the amount to which the image should be printed out, but this criterion will be satisfactory for preliminary trials. The correct way, however, is to determine the exposure by the depth of the finished print, that is, one which has been developed to the tone desired, fixed, and dried. Contrary to the procedure of

ordinary printing methods, the exposure here must be exactly correct, since it is impossible to compensate by altering the development time. As experience is gained, it is possible to judge exposure and development at different stages of the process, as in the developer or in the fixing bath. In proper hands this process has decided possibilities, and the operations involved are no more difficult than those encountered in various other printing processes. However, departure from the fixed conditions we have attempted to set forth will probably lead to failure.

Type of Negative Required. Before considering the type of negative best suited for this process it may be advisable to include a few well-known facts concerning reproduction in general. It should be understood, first of all, that any negative material is limited in its ability to reproduce a given scale of tones in the subject. This is commonly referred to as the latitude of the plate or film. In going one step farther, from the negative to the print, another limitation is placed upon us, inasmuch as the scale of the paper is insufficient for rendering correctly the entire range of every negative. This is naturally the reason for the different types of paper on the market. Now the more closely the scale of the paper approaches the scale of the negative the better the reproduction. As the contrast of the paper is increased the available scale is diminished and thereby the range of tones in the subject is distorted. Hence for a contrasty type of paper a soft negative is always used, and *vice versa*.

In this process the developer necessarily tends to effectively increase the contrast of the paper used. This is shown graphically by the figure, where Curve I represents the normal development of Artura chloride. Curve II shows the effect of developing an over-exposed print on the same paper under the conditions required for obtaining a good sepia. In the diagram the two curves are plotted side by side, although the exposure in the second case was about seventy-five times that for the first. The latitude of the paper in each case may be measured by the projection of the approximately

straight-line portions of the curves onto the horizontal axis. Thus the distance between A and B represents the approximate latitude for Curve II and similarly that between C and D for Curve I. It will then readily be seen that the sepia print can render only a little over half of the range of tones reproduced by the black-and-white. Consequently we must deal with it as if it were another type of paper.



In view of the preceding statements it is apparent that the range of negatives suited to the use of the direct-development process is more limited than that for ordinary reproduction. But, just as any photographer usually develops his negatives to suit the particular kind of paper he uses, so in this case, by altering the time of development, he may adapt his negatives to conditions here met with. Such distinctive and pleasing tones are possible for at least some classes of negatives that it may be of interest to certain careful workers to give the method a trial. With soft portrait negatives of a certain quality excellent work may be done using tones such as olive sepia or decided olive. It is practically impossible to describe the kind of negative with which a reasonable degree of success is insured, but a little experimenting should indicate once and for all the exact type necessary. Another line of work to which this process is peculiarly adapted is the reproduction of paintings and etchings. Here a rich etching sepia is readily obtained.

In conclusion we will state in a more concise and explicit way the method of using the process, along with such added information as may be necessary.

The solutions required are as follows:

DEVELOPER:

Chlorhydrochinon	5 gm.
Sodium sulphite	30 gm.
Sodium carbonate	16 gm.
Potassium bromide	6 gm.
Potassium metabisulphite	6 gm.
Water to	1000 c.c.

Acid short-stop: Two per cent. acetic acid solution.

Fixing bath, plain hypo or bath containing Velox liquid hardener.

(NOTE.—Bisulphite or metabisulphite baths must not be used, as they are detrimental to the tone.)

Directions. A sheet of Artura chloride paper should be exposed under a typical negative to electric arc, the mercury vapor, or the nitrogen tungsten lamp. The exposure required will be about 75 to 100 times normal, and the image should be faintly visible. The paper should then be cut into several strips and each developed for different lengths of time.

The time of development must be accurately controlled to within five seconds, and to assist in this the acid short-stop should be used. The prints should be rinsed before placing in the fixing bath. Develop the first strip one minute, and remove the others at intervals of from ten to fifteen seconds, noting the exact time for each print. Fix ten minutes, wash, and dry.

This will give a series of prints in different tones which should range from red to olive. If such is not the case, extend the range of development times. At this stage the exposure is of less consequence than the time of development necessary to produce the tone desired. From the quality and depth of the print it will be evident whether exposure has been correct or not. A few trials will determine the proper adjustment. Having now determined the approximate exposure required and the manner in which the tone changes with development time, it will be relatively simple to fix the exact time necessary to produce any given tone. If the tones vary widely repeat the trials, using intermediate times of development, as the latter may be a question of only a few seconds differ-

ence. It will be observed that development proceeds very slowly at first, but speeds up considerably as it continues. The print will be much darker in the developer than when fixed and dried, as fading takes place in the fixing bath, and the color will be much different from that of the dried print. Hence make no judgment of tone until the print is perfectly dry. It should now be possible to select the proper time of development and to then adjust the exposure to give the desired quality, after the manner similar to that used in ordinary printing. It is difficult to give more explicit instructions than these, but if they are intelligently followed experience will be rapidly gained and the operator should then be able to obtain satisfactory results.

We have up to this point not advised the judgment of tone until after the print was dried. After a number of observations on the change of color in the developer, however, it will be quite possible to determine the stage at which development should be stopped. A marked purple veiling appears at about the proper development time. By now carefully watching the print (which may be done by rather strong yellow or weak tungsten light, because of the very heavy exposure already given) and correlating the colors of the prints on removal from the developer with those of the same prints fixed, washed, and dried, the skilled worker will readily acquire the proper criterion at an intermediate stage of the process. In a similar way the appearance of the print in the fixing bath may afford a method of judgment of tone. But for the first trials of the process development by time alone is recommended.

The limitations of the process, as we have tried to point them out, should be kept in mind. As the question of tone is simply one of individual taste it may be found that with some negatives it is impossible to secure tones pleasing to the operator. If such is the case some other type of negative should be used, remembering the remarks under considerations on the kind of negative suited to the process.

Some negatives will tend to produce so-called double toning; that is, the high-lights are likely to appear pink. No remedy for this can be found, but it may not always be objectionable.

Finally, there are several conditions to be observed in order to secure reproducibility of color from print to print. The temperature of the developer must be kept constant if the same time of development is to be used. As with every photographic process, pure chemicals should be employed, and the solution should not be kept too long before using. The prints should be developed in a liberal quantity of the solution. Although quite a number of prints may be developed in this amount it should not be overdone, because the tone is so dependent on the time of development.

As has already been stated the tone is not due to an oxidation product, but simply to the state of division of the silver. Prints made by the method just described are probably as permanent as those of any other toning process, as shown by very severe tests made by exposure to sunlight for a period of six months. No difference could be observed between the shielded and exposed portions of the print.

INDIVIDUALISM

DURING a conversation with one of the best-known and most successful photographers on Fifth Avenue, the other day, he mentioned that his dark-room man was leaving him, and his best printer was on the

sick list, "but that doesn't alarm me," said he. "I am as much at home in the dark-room or printing room as under the light." The following article from an old number of the *British Journal of Photography* shows that

individualism and self-reliance are of first importance in the photographic business:

These are days of competition, when the position of the very foremost professionals is assailed. Men who ten or twenty years ago considered themselves above competition are now compelled to compete in the race for position. This competition has been the making of some photographers; others, alas, have fallen by the way.

Workers who a decade ago were considered clever can today only rank as good ordinary photographers; they can turn out good ordinary work, but so can thousands of others, with the difference that the others who have not heavy expenses and large establishments to keep up can do their work at cheaper rates. In these days of cheapness, if a patron can get work of an equal quality at a lower rate, he will not pay a bigger price for the pleasure of seeing some well-known photographer's name at the foot of his print, and thus these same workers who ten years ago did good ordinary work and made it pay are badly off today, while those who go in for a specialty and do work out of the common are sure of retaining their old patrons and adding considerably to them as the years roll on.

The "middle" class photographer has improved his work by leaps and bounds, and there is no longer the wide chasm between their work and that of the front-rank man. They can both take and finish photographs with skill, but the one stamps his work with individualism, and the other turns out good ordinary work. The labor is nearly the same in each case—the one is little more costly to work than the other—but the difference in the payment is a wider difference than of old. Take the work of the front-rank man (to name one or two when so many are worthy of mention would be unfair); you can tell at a glance who the artist is. "Oh, that is So-and-so's style," you exclaim; but do you stop to think why you recognize it as such? You did not require to look at the name at the foot to trace the artist; his work tells you. It is, in fact, individualistic. The same man-

nerisms run through the whole of his work: a certain pose, lighting, style of background or of mounting, color of print, or perhaps a bit of each. No matter what it is, it is something out of the ordinary, and that is the whole secret.

There was never a time in the history of photography when good work was more in demand, for the public have been educated up to a higher standard than would have satisfied them ten years ago. They don't want the common or garden photograph, but an artistic effort. The old album, with its places for C.D.V. and cabinets has been carefully stored in the lumber-room for the benefit of future generations, who will no doubt derive considerable amusement from it. There is no royal road to individualism, though it can be attained by anyone possessing artistic feeling if they are willing to study, and it is a study that will repay the professional photographer a hundredfold. In fact, I go so far as to say that no professional photographer can get on without giving this matter considerable thought.

It would be foolish to point out the defect without giving the means of remedy. This will not be a difficult task. My advice is to go to the nearest art gallery and study the old masters; take one of these for your model, and see as many of his works as possible. They will all vary in some particular, but the same individualism will run through all. I go so far as to recommend you to have your backgrounds painted in a similar style to those used by the artist. You may only have everyday sitters to photograph, but that need not deter you from the work, for you must remember that these same subjects were everyday people when the portraits were painted. Follow your artist closely for a little while, and you will then get the style of work, after which you will be able to put your own individualism into your work, thus making your work after the school of Gainsborough, Vandyke, Reynolds, etc., but from a photographic standpoint of your own.

A high-class photographer, who has



SIR RABINDRANATH TAGORE
BY C. CROWTHER, F.R.P.S.
KOBE, JAPAN



made a moderate fortune out of the work, gave me the following information in reply to my request as to how he had made his business so successful in so few years, in face of the bad times and great competition. "I made up my mind," said he, "that there was no room for a photographer who could only turn out ordinary work at ordinary prices, so I decided to do something out of the common, and charge my own price. But what should I do and how should I do it? Happy thought! Why not go to London and see how the old masters worked? I spent a week in the National Portrait Gallery, the National Art Gallery, the Academy, Tate, etc. This was my first step upward, and since that week I have spent many happy hours in the same places, and have always returned home with new ideas and higher aspirations. Considering I worked my business up from midgets at 4s. 6d. per dozen to its present position, I consider my holidays in the London art galleries my cheapest outings and greatest help."

I can only recommend my readers to give this advice a trial, and then I feel sure we shall hear less of bad trade and of that very useful and necessary competition that is so much to the front at present. What is wanted is better work. There is plenty of room on top, but a man will never get there if he keeps in that same old rut of ten years ago. That particular rut leads down hill, and it is time to get out of it.

I will summarize my remarks with a few hints of what to do and what not to do.

The ordinary interior and exterior backgrounds are dead. They have

done their duty; let them rest in peace. Go in for a special background painted to your own ideas, and use as few studio accessories as possible. Change the whole of your backgrounds as often as means will allow. Your clients do not want photographs of balustrades, steps, or pedestals, but of themselves. On the other hand, graduated backgrounds may be good for vignettes, but do not use them for everything. If your pocket will not run to a specially painted background, try a plain white or black one with a continuous foreground; but have something out of the ordinary.

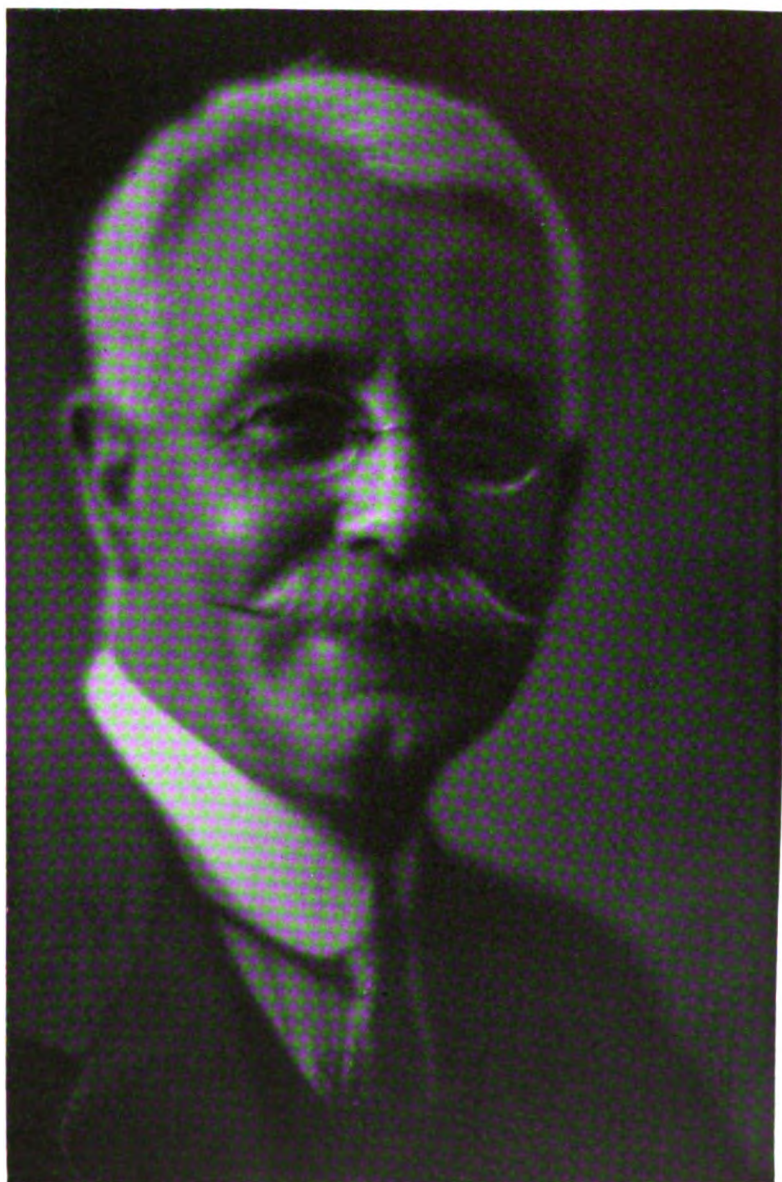
Lighting must follow the background. If you are having your background painted after Gainsborough, follow his lighting also. I have seen work by front-rank men with the sitter beautifully lighted, but in absolute contradiction to the background, thus spoiling the whole effect.

Do not use the easiest printing process because it is the easiest, but use the one that shows off your work to the best advantage. Every good photographer should be able to make a first-class print in sepia and black platinum and in carbon. Do not leave yourself too much in the hands of your printer. Not only should you be able to tell when a print is well done, but you should be able to show your printer how to do it. The printing room is just as important as the studio, but how many photographers give it the attention it should have? There is as much money made in the printing room as in the studio, but through want of attention many a photographer is ruined by the printer's bad work.

FOCAL LENGTH AND PICTORIAL QUALITY

IN order to compare the pictorial merits of two photographs of the same subject, taken with two lenses of different focal lengths, the first essential is that both should be reproduced on the same scale. The effect

of a direct print from a quarter-plate negative will be very different from the effect of even a half-plate enlargement from the same negative. No comparison can fairly be made between the direct results obtained by means



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of a short focus lens and those produced by a lens of two or three times the focal length. Many photographers now, either from choice or as a matter of convenience, use a small pocket camera with correspondingly short focus lens; but few are content with a direct print. It is therefore not with the pictorial qualities of the negative itself that we are concerned, but with its capacity for producing artistic results in the enlarging camera.

In the following notes it must be kept in mind that the rules laid down only hold good for results on the same scale. It is taken for granted that either the smaller negative is enlarged from or the larger one reduced, so that the inherent pictorial properties of the two can be compared without being interfered with by arbitrary considerations of size. It is always within the power of the photographer to make his finished print on any scale he pleases, and to include as much or as little of the subject covered by the original negative as he thinks desirable.

The focal length of the lens only determines the size or scale on which the subject will appear on the negative. As the latter is merely used as the source of the final picture, and as this last can be made on any scale that is desired, it may be said that the focal length of the lens has no necessary connection with the size of the resulting photograph.

The focal length of the lens can, under no circumstances, have any effect whatever upon the perspective, or upon the general arrangement and relative sizes of the different parts of the subject. All photographs of the same subject, taken from the same point of view, and with the lens pointing in the same direction, have identically the same perspective, no matter what may be the focal lengths of the lens. This is the most elementary of facts, but it is the one which is most frequently called in question. The statement that "short focus lenses give distortion" is made and emphasized again and again even in technical handbooks, some of which are adorned with faked illustrations showing the distortion "due to the use

of a short focus lens." All such distortion is due to the error and bad taste of the photographer in having brought the camera too close to the subject he wished to photograph, and the distortion has no connection whatever with the focal length of the lens.

The depth of field, or the degree of sharpness in planes other than the one directly focussed on, depends entirely upon the actual effective diameter of the stop used, *i. e.*, upon the diameter of the pencil of light which enters the lens, and not at all upon the focal length of the lens. This may seem obviously incorrect at first sight; yet common sense is sufficient to teach us that if two lenses see the same view, in the same way, they will reproduce it, and they will see the same view if the same light, and the same amount of light, enters them from all points of the subject. Diffusion of focus in all planes save one is really a parallax phenomenon, due to the eye of the lens being sufficiently wide to look round the various parts of the subject and produce a slight stereoscopic effect. The stop diameter determines the extent of the parallax; the focal length only determines the scale on which the parallax will be rendered on the direct negative, which is a negligible consideration.

It follows from the above that long focus lenses give greater diffusion of focus in planes where softness is desired only in so far as they admit of stops having larger actual diameter. A curious result of this is that the removal of the front component of a double lens, while increasing the direct scale of the negative, diminishes rather than adds to its pictorial quality. For if the front component is a positive lens, the pencil of rays which passes through it is already condensed before it reaches the stop, and is therefore of larger diameter than the stop itself. This advantage disappears when the lens is removed.

To given an example of comparative depth of field: There is now on the market a 3-inch lens having the astonishing aperture of $f/1.9$. The diameter of the diffusion disks, which determine



THE AUTHOR OF "TIGER"
BY C. CROWTHER, F.R.P.S
KOBE, JAPAN



depth of field, given by this lens at full aperture, will be the same as that given by a 7-inch lens working at $f/4.5$, when both photographs are reproduced on the same scale. For most purposes this is an inconveniently large amount of diffusion. A lens of such large aperture can hardly be expected to have the same high degree of optical correction or the same covering power as one working at $f/5.6$ or $f/6.8$, either of which in the $3\frac{1}{2}$ -inch size gives all the diffusion that is generally required.

In ordinary work, where short exposures are necessary and extreme diffusion of focus is undesirable, short focus lenses have the great advantage that a stop of large f value, *i. e.*, of great rapidity, can be used without unduly blurring or softening the details at varying distances. For any desired degree of uniformity of definition over the whole field, the rule is that the f number of the stop used must be proportionate to the focal length of the lens. This follows directly from the above considerations as to comparative depth of field. A lens of $3\frac{1}{2}$ -inch focus at $f/5.6$ will correspond to a 7-inch lens at $f/11$, because the actual stop diameter will then be the same in both cases. The time of exposure, therefore, varies directly as the square of the focal length. A lens of half the focal length of another can thus be used with a stop only requiring one-quarter the exposure which must be given with the longer focus lens to secure the same result. This is particularly useful in the photography of dark interiors, where exposure with a stop of small rapidity would be tedious. With a high rapidity stop it also becomes possible to use a light color screen when taking snapshots of suitable, well-lit subjects.

For lenses constructed on the same optical formula the amount of view which can be included is the same, no matter whether the lens be of short or long focus. For instance, a lens of certain make may be listed to cover an angle of 60° at full aperture, and an angle of 90° when stopped down, and this will apply to the whole range of lenses so listed. But it is almost invariably assumed by those who object

to the use of short focus lenses that short focus work means wide angle work, even when the subject demands a narrow angle of view, and that violent perspective, or distortion, must therefore appear in all such results. This is a quite inaccurate and misleading supposition. The worker with a 3-inch lens may adopt such a small plate that he will only be in a position to obtain narrow angle results. Or he may use a slightly larger plate giving the more generally useful medium angle. Or he may mount the lens in a camera which permits the whole angle of view covered by the lens to be recorded. The advantage of a small short focus lens is that it allows the use of the relatively larger plate without materially increasing the bulk or weight of the apparatus, and in the many cases where wide angle work is necessary the lens and camera are ready for it without any alteration or adjustment whatever. No photographer, who has limited himself to narrow angle work, by the type of apparatus he adopts, can fail to regret occasionally his inability to take some attractive subject requiring a wide angle when such a subject presents itself. A most useful combination is a lens mounted in a camera which uses a plate or film whose longest side is equal to the focal length of the lens, say, a $3\frac{1}{2}$ -inch lens mounted in a $3\frac{1}{2}$ by $2\frac{1}{2}$ camera. But whether the large or the small plate be used, the narrow angle subject will always be on the plate, and when the enlargement comes to be made the operator can choose only those parts of the negative which will give exactly the composition and perspective he wished to obtain. In other words, the focal length of the lens has nothing whatever to do with the particular view angle included by the resultant photograph, but the adoption of a short focus lens used on a relatively large plate makes it possible to do all kinds of work, from extreme narrow angle to comparatively wide angle, with the same facility, and without any trouble or delay in setting up new apparatus or changing the lens.

In this one point, halation, alone there is a danger that the work of the



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KOBE, JAPAN



short focus lens may show inferiority to that of the lens of long focus. This applies equally whether it is the result of reflected light from the back of the plate or of radiation in the substance of the film itself. Say, for instance, that the subject to be photographed includes some bare branches of trees against a bright sky, and that the stop used is $f/8$. The area of the image of the sky made by a short focus lens will be less than that made by one of longer focus, but the intrinsic brightness of the image, *i. e.*, its brightness per unit area, will be the same in both cases, and the tendency to halation will therefore be the same. The *direct* amount of halation, if it is allowed to occur at all, will be equal, and when the smaller negative is enlarged the halation on the resultant photograph will be greater than that given by the longer focus lens. Again, the image of the tree branches will be thinner and more thread-like in the smaller than in the large negative, and will offer less resistance to the effects of halation. The image may therefore be completely halated away in the one case, where in the other it will only be more or less blurred. Curiously enough, the first favorable reference I ever saw in a photographic paper to the work of short focus lenses was to the effect that they give *less* halation, "because the points of light are smaller." It is only stellar photography that is concerned with points of light. Ordinary photography deals with light areas, and the size of these areas, unless microscopically small, does not affect halation. Dr. Mees has shown that even in microscopic work halation is a serious factor. In actual practice, however, halation does not often show itself. If backed plates are used a whole holiday may be spent in company with a 3-inch lens without a single negative being injured from this cause. It seems to be the one poor advantage indisputably attached to the much-praised long focus lens that it is less

liable to err in this respect, and it is proper that it should get credit for it.

Some general considerations may be added here. If it is desired to preserve the useful properties of short focus lenses in actual practice, it is, in the first place, necessary that there should be critically accurate registration of the plate in the focal plane, and a critically accurate and accurately placed focussing scale. With a good lens of modern make it may be taken for granted that the true infinity distance has not been found unless it is possible to read clearly words composed of letters each of which is less than $\frac{1}{200}$ inch in diameter, on a negative taken with the full aperture of the lens. Fine definition such as this may not be always required, but it is imperative that it should be obtained with certainty when wanted. And the same accuracy should also be possible when focussing on lesser distances. All defects of focus will, of course, be increased when the negative is enlarged from. This critical definition cannot be got by the use of a focussing screen, but it is secured without the slightest difficulty or uncertainty once a correct and sufficient focussing scale is fixed in proper position. The adoption of a fixed hyperfocal distance in cameras with short focus lenses in order "to avoid having to worry about a focussing scale" is a most unscientific and inartistic method, and the results are certain not to satisfy the serious worker. The hyperfocal distance is only true for the *direct* results of the lens, it is only true for *one* lens aperture, and its usual standard of sharpness ($\frac{1}{100}$ of an inch) is very low.

No illustrations to this article are needed. For proof of the general position advanced it is only necessary to visit any good cinematograph theatre. We may there see large-scale photographs of admirable pictorial quality, taken for the most part with lenses of the shortest focus.—*British Journal of Photography.*



BY THE BACHRACH STUDIO

BALTIMORE, MD.

TWO NEW COLOR SENSITIZERS

By ALFRED B. HITCHINS, PH.D., F.R.P.S., F.C.S.

FOR the past two years it has been practically impossible to obtain Pinaverdol or Pinacyanol, the two dyes hitherto used for green and red sensitizing and in conjunction with other dyes for panchromatizing. Recently Professor W. J. Pope, of the Chemical Laboratory of the University of Cambridge, England, has produced two dyes, "Sensitol Green" and "Sensitol Red," that are intended to replace Pinaverdol and Pinacyanol. Samples of these new dyes were obtained through the kindness of Mr. F. F. Renwick, of the Ilford Dry Plate Works, Ilford, London, who are marketing the dyes. Sensitol Green and Red are stated to be of the same chemical composition as Pinaverdol and Pinacyanol. Pinaverdol is p-Toluquinaldinquinolinium-methylcyaninbromide. Pinacyanol is not a true isocyanin, but is the result of the action of alkali on a solution of quinaldinium salts to which formaldehyde has been added.

In making the series of tests of the sensitizing properties of Sensitol Green and Red, Hammer "Record" plates were bathed in alcoholic and aqueous solutions of the dyes as follows:

	Alcoholic.		Aqueous.	
	Red. C.c.	Green. C.c.	Red. C.c.	Green. C.c.
Distilled water	500	500	500	500
Methyl alcohol	250	250		
Stock dye solution	10	15	7.5	7.5-10
Stock dye solution = 1 gram of dye in 1000 c.c. of alcohol.				

The time of bathing for all the plates was three and a half minutes at 65° F. Plates from the aqueous bath were washed for three minutes previous to drying; from the alcoholic bath dried without washing. Spectrophotographs were made on the plates resulting from the various methods of bathing. A Hilger diffraction grating spectograph was used with Nernst light and a slit 0.09 mm. The results are shown in the accompanying figure.

No. 1 shows the color sensitiveness curve of the undyed Hammer "Record" plate. This curve is characteristic of non-color-sensitive emulsions. The maximum is in the blue and there is no yellow, orange or red sensitiveness.

No. 2 shows the sensitiveness conferred by Sensitol Green in alcoholic solution.

No. 3 is the result of Sensitol Green in aqueous solution. It is apparent that Sensitol Green is an excellent green sensitizer. It confers great sensitiveness to the whole of the blue-green, yellow-green, and yellow, and extends its action into the orange-red. It is equal in every way to Pinaverdol.

Nos. 4 and 5 show the action of Sensitol Red in alcoholic and aqueous solutions. Sensitol Red has the property of strongly sensitizing for red, orange, and bright (yellowish) green. Although it appears to sensitize for the blue-green a little more than Pinacyanol, yet there is but a feeble action and a safe light emitting only blue-green between wave-length 5000-5200 can be used. Sensitol Red is a better red sensitizer than Pinacyanol.

No. 6 is the result of bathing in a mixture of alcoholic solutions of Sensitol Green and Red, as follows:

Distilled water	500 c.c.
Methyl alcohol	250 c.c.
Sensitol Red stock solution	10 c.c.
Sensitol Green stock solution	14 c.c.

Bathed three and a half minutes; dried without washing.

There is an increased red sensitiveness due to the combination of the dyes, and the gap in the blue green is well filled in. Some of the plates thus panchromatized were used upon colored objects under the usual conditions of panchromatic photography, and gave most satisfactory results.

Bath.	Fog.		Development factor,		Inertia.	Speed.
	3 minutes	6 minutes	3 minutes	6 minutes		
Not bathed	0.068	0.1	0.67	1.19	0.29	117
Aqueous sensitol green	0.12	0.222	0.83	1.23	0.36	94
Aqueous sensitol red	0.13	0.23	0.47	0.95	0.55	62
Panchro bath	0.15	0.24	0.97	1.38	0.64	53

Developed in absolute darkness in H. and D. standard pyro-soda without bromide. Temperature, 65° F. Exposed 40 C.M.S. to screened acetylene.

Nos. 7 and 8 show the absorptions of the two dyes. A series of Hurter and Driffeld speed determinations were made of the plates treated in the different baths and also of the undyed plates, the data obtained are shown in the table below.

Both Sensitol Green and Sensitol Red increase fog, the Red having the greater effect.

The development factor is raised with Sensitol Green and lowered with Sensitol Red, a combination of the two dyes also raises the development factor.

The original speed of the "Record" plate was 117 H and D. Sensitol Green reduced it to 94; Sensitol Red cut the speed to 62; bathing in the panchromatizing solution, composed of the two dyes, reduced the speed to 53.

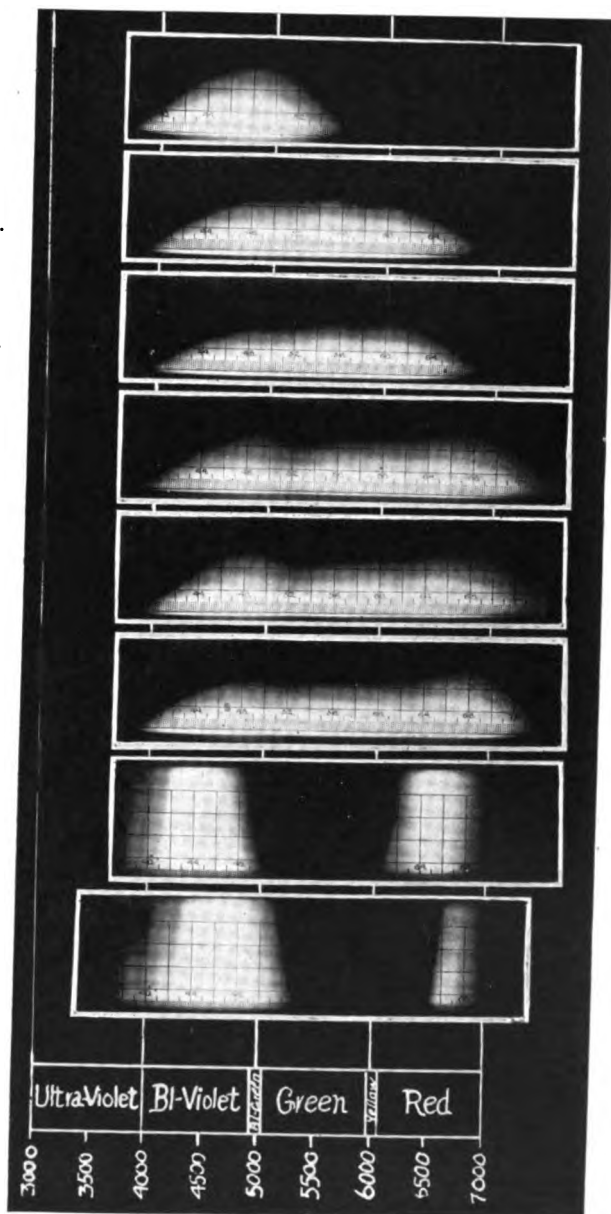
A number of the plates bathed in Sensitol Green and Red were tested for chroma. This gives a more or less quantitative expression of the sensitizing property of a dye. It is determined by exposing two strips of the plate in the Hurter and Driffeld machine, one through a yellow filter, the other through a blue filter. The developed strips are read as usual on a photometer and the curves plotted on the ordinary H and D chart then the ratio

$$\frac{\text{Yellow inertia}}{\text{Blue inertia}} = \frac{\text{Blue sensitiveness}}{\text{Yellow sensitiveness}} = \text{Chromo} = \chi$$

The following values for χ were obtained.

Plate bathed in Sensitol Green	2.20
Plate bathed in Sensitol Red	1.91
The lower the value of chroma the higher the color sensitiveness.	

1. Undyed Plate
Hammer "Record"
2. Sensitol Green
Alcoholic bath, $\frac{1}{10000}$
Bathed $3\frac{1}{2}$ minutes at 65° F.
3. Sensitol Green
Aqueous bath, $\frac{1}{10000}$
Bathed $3\frac{1}{2}$ minutes at 65° F.
4. Sensitol Red
Alcoholic bath, $\frac{1}{10000}$
Bathed $3\frac{1}{2}$ minutes at 65° F.
5. Sensitol Red
Aqueous bath, $\frac{1}{10000}$
Bathed $3\frac{1}{2}$ minutes at 65° F.
6. Panchromatic Bath
Sensitol Red, $\frac{1}{10000}$
Sensitol Green, $\frac{1}{10000}$
Bathed $3\frac{1}{2}$ minutes at 65° F.
7. Sensitol Green
 $\frac{1}{10000}$ absorption
8. Sensitol Red
 $\frac{1}{10000}$ absorption



In connection with the above-described Hurter and Driffeld tests it was found that the alcoholic dye baths gave a little less fog, but that the other factors were affected almost equally in either the alcoholic or aqueous baths. Neither of the dyes keep very well in aqueous solution but keep very well indeed when made up with alcohol and kept from the light. Either Sensitol Green or Red can be used for sensitiz-

ing collodion emulsion; with Sensitol Red 1 part of stock dye solution is used to every 100 to 200 parts of emulsion. With Sensitol Green use 85 cm. of stock dye solution to every 1000 cm. of emulsion.

From a general survey of the results obtained it is evident that in Sensitol Green and Red we have two excellent sensitizers that are the equal in every way to Pinaverdol and Pinacyanol.

MODERN METHODS OF CARBON PRINTING

ONE of the methods of getting better prices is to produce good work by an unusual process. The carbon process offers an attractive medium. It is absolutely permanent, offers a variety of tones, and is simple to work. Mr. E. Grendon Underwood gives, in *The Amateur Photographer*, a clear, concise method of working the process that is well worth trying:

Some modifications introduced of late years into the practice of carbon printing have considerably simplified it, and anyone who will take the trouble to understand and master the few and simple requirements of the process will be amply repaid by the results. It has, unfortunately, acquired the reputation of being a tricky process, but this trickiness is entirely the result of neglecting its primary requirements. If these are complied with, there is no trickiness, and it is in mitigation of the stringency of these requirements that the above-mentioned modifications have reference. Its advantages of permanence, purity, and certainty of color, absence of chemicals, and much washing need no enlarging upon; it is its shortcomings, looked at from the busy worker's point of view, which claim attention. The points which need this attention are as follows:

1. Keeping the sensitized tissue before using.
2. The printing or exposure being "blind" process.
3. Keeping after exposure.

It will be noticed that two out of the three points refer to the keeping, or rather the non-keeping, properties of the tissue, and with a little care we can practically eliminate this trouble. It will, however, be best to go through the process from the beginning, and elucidate the several points as we come to them.

The tissue, in certain standard colors, may be had from the manufactures in a sensitized state, ready for exposure. Or it may be had in the insensitive state, requiring to be sensitized, the choice of color in this state being much greater, as it will keep thus indefinitely without any special precautions, and can be sensitized at any time.

For sensitizing, the following solution, a modification of Mr. Bennett's, is recommended. It has the advantage over the old 5 per cent. ammoniated potassium bichromate of enabling the tissue to be kept under ordinary conditions for a much longer period:

Potassium bichromate	6 drams
Water (hot)	15 oz.

When dissolved and cooled, place in a white dish, and cautiously drop in ammonia liquor fortis till the color is changed to a light lemon. Any small excess of ammonia will pass off if left in the dish for a time. Now take

Citric acid	90 gr.
Water (hot)	10 oz.

This has to be neutralized by ammonia in the same way, but as there is no change of color in this case, the test is made by what has been described as the best test for ammonia, viz., the nose. Add a few drops of the ammonia, and stir well; if there is no smell of the ammonia, it has been absorbed by the acid, and a few more drops may be added, and so on, till there is just a slight permanent odor. Mix the two solutions, and when quite cold it is ready for use and may be used repeatedly, being all the better for an occasional filtration.

Pour the sensitizing solution into a dish, and immerse the tissue in it for about two and a half minutes, taking care to remove any air bubbles from the surface, and keeping all parts under. Take it out of the liquid by one end, and lay it, face downward, on a piece of ferrotype plate or ebonite somewhat larger than itself, commencing at one end, so as to drive air and liquid before it. Drain off the superfluous solution, lightly squeegee, and wipe over with a cloth or sponge. This may be done in daylight, as the tissue when wet is insensitive, becoming sensitive to light as it dries. A very subdued daylight only must therefore be allowed to fall upon it; ordinary artificial lights have no effect. It must be dry enough to strip readily from the plate in five or six hours; if it takes much longer it will be insoluble and useless. It may be dried in a few minutes if desired by immersion for five or ten minutes in a bath of Columbian spirits. This absorbs most of the water, and it may be finished by warmth if necessary, but it should not be made bone dry, or it will print very slowly. If it is to be kept any length of time, it is a good plan, before stripping it from the support, to pencil the date on the back. Tissue thus sensitized will continue in good condition, if kept ordinarily dry, for two or three weeks, as will that bought ready sensitized. If it is made quite dry, and packed flat under pressure in a box from which damp is excluded by means of rubber, or in which some calcium chloride is kept to absorb moisture, it will keep for six months or more. A certain amount of moisture in the film is necessary for

printing, and, thus kept, it will require an hour or two (more will not hurt) in an ordinary atmosphere, or a few minutes in a cellar will fit it for use.

For the printing, the negative has to be provided with what is called a safe edge, the object of which is to retain a soluble margin by protecting it from the action of light. This may be a strip of opaque paper, a quarter of an inch wide, fixed all round the negative on the glass side. If the printing frame is larger than the negative, with a separate glass in it, as all printing frames *should* be, then a convenient form may be made by placing in it a piece of paper the full size of the frame, with an opening in the middle a quarter of an inch smaller than the negative. The negative is simply placed centrally on it, the pigment side of the carbon tissue on it, and the frame closed. Those parts of the tissue which are acted upon by the light passing through the negative, and which would in a silver print become dark, are rendered insoluble; while the parts which are protected from light in varying degree by the denser portions of the negative, retain their solubility in warm water. We don't have to examine it during printing, as no change can be seen. This being so, we have to place beside it during the printing some arrangement by which we can have a visible image, and so measure the light action. A simple way of doing this is to take another negative of the same density and color and place a small piece of P. O. P. behind a fairly dense part of this having detail in it. When the P. O. P. is almost sufficiently printed it may be taken as a sufficient exposure. This, of course, involves matching every negative, and many prefer to use an actinometer. This may easily be made with a cleaned-off quarter-plate and some white tissue paper. Take a strip of the paper, 4 in. by 1 in. Stick this on to the glass by gumming down each edge. On this fix another similar strip, but a quarter of an inch shorter, and then other strips, each one a quarter of an inch shorter than the last. At one end they are all placed level, and thus we have a graduated series of fifteen thicknesses of paper. Then with a

small brush and some Indian ink write 1 (backward) on the single thickness, 2 on the second, and so on up to the 15. This is used by placing a strip of P. O. P. behind it in a printing frame, another piece behind a fairly dense part of the negative to be printed from, and exposing the two together. When the P. O. P. behind the negative shows a rather light print, it may be considered sufficient, and the highest number showing on the actinometer is its measure. This number it is convenient to mark on the edge or rebate of the negative, or the actinometer strip may be kept with the name of the negative penciled on the back.

We now come to the development of the print, which brings us to a point where a few words must be said about what is called the continuing action. The meaning of this is that, when the action of light on bichromated gelatin has once started the change which renders it insoluble, this change will continue to go on, even without any light action, until the whole has become insoluble. From a consideration of this fact it is obvious that, the printing once completed, the change thus set up must be arrested. The usual way to do this is to develop the print at once, but it is often more convenient to adopt the latter-day method of removing the unaltered bichromate from the film by washing it out. If the tissue, as taken from the printing frame, is placed in cold water for five minutes or so, a considerable proportion will dissolve out. A swilling with fresh water and two or three more soakings will entirely eliminate it, which will be evidenced by the paper backing becoming white again. It may now be squeegeed down and dried anywhere. Development can be postponed till convenient, and no special precautions in storing are necessary.

Development may also be deferred by making bone dry and storing as described before printing. The actual operation of development is that of washing away with warm water the surplus material, gelatin and color, which has not been rendered insoluble and is therefore not required in the finished print. This washing-away de-

velopment has to be done from the back of the tissue, for the reason that the lighter parts of the print are formed on its surface, next to the negative, the gelatin being made insoluble right through only in the darkest parts of the print. Consequently, if the tissue is placed in warm water, these lighter parts will be carried away by the soluble gelatin supporting them being dissolved. We have, therefore, to squeegee the tissue on to some support, permanent or temporary, in order that we may work from the back. The most convenient support is a piece of smoothed opal glass, which has a surface similar to ground glass. This must be thoroughly cleaned and waxed over with the following:

Turpentine	1 oz.
Paraffin wax	10 gr.

Make a small pad of old cotton or linen cloth, such as an old pocket handkerchief, of six or eight thicknesses and an inch or so square. With this smear the surface of the opal lightly and uniformly over with the wax solution. It takes very little, a mere film being all that is required, but care must be exercised that no parts are missed. In a quarter of an hour or so it will be ready for use. Now have a dish of clean cold water, with the opal beside it on the table. Place the exposed tissue in the water, surface up, and pass a camel-hair brush over it to remove air bubbles, etc. It must now be closely watched; at first it will curl up inward, owing to the paper backing absorbing water quicker than the gelatin. In a very short time, from thirty to sixty seconds, it will begin to flatten out again, when it must at once be lifted out by one end, the other end laid on the opal and lowered into place, driving air and water before it. If it is left too long in the water, the gelatin, continuing to absorb it, becomes swelled and larger than the paper backing, and it will be impossible to make it adhere to the opal. Quickly tip the surplus water off, and squeegee down firmly, but not hard. Wipe off with a cloth, and place on it a few thicknesses of blotting-paper, an old negative, and a weight, nothing very great being required. Ten minutes or

so of this will be sufficient, and it is then placed in a good-sized tray of warm water, of a temperature of 100° to 120°. If the exposure has been anything like right the color will soon begin to ooze out round the edges, which have been kept soluble by the safe-edge. This would be, perhaps, a minute, often more, but there is no need to hurry with this part of the process. When the color is coming out freely, lift the backing by one corner, and pull it gently and steadily off. If the color fails to show in a few minutes, hotter water must be used; if this is ineffective in, say, ten minutes, the gelatin will have become insoluble. This may be due to over-exposure, to defective keeping in the sensitive state, or to the drying after sensitizing being too prolonged. In the case of tissue purchased ready sensitized, this last will not be one of the causes. It may now be rocked about in the water, or one end raised and the water laved over with the hand to complete the development. This takes some few minutes, and cannot be hurried. If the color comes off very quickly it is underexposed, and cooler water may save it. If, on the other hand, it is very slow, overexposure is indicated, and hotter water must be used. There is a considerable amount of latitude of exposure in the process in this way, but if the water is very hot, approaching the boiling-point, there is risk of breaking the film, which is very delicate at this stage.

The image should be made just a shade light in the development, as, when dry and transferred to the final support, it gains in strength a little. The desired stage being reached, give a slight wash in cold water, and immerse for ten minutes in an alum bath, say 10 per cent., but the exact strength is immaterial. After this give another small wash, to remove the alum, and set up to dry. All we have to do now is to transfer the print to its final support, which is a very simple operation if carried out as follows: This final support is a gelatin-surface prepared paper obtainable of the tissue manufacturers, and a piece an inch larger each way than the print is required. Place this in a dish

of clean cold water, and brush the surface over with the camel-hair, then place the opal in warm water, 90° to 100°, and leave for five minutes. Now take the opal out, drain off slightly, and place close to the other dish. Turn the final support over, face downward, in the water, and lift out by one end. Place the other end on the opal, half an inch from the picture, a finger and thumb on this, and gently let down. Now, before removing finger and thumb, take the squeegee and make three or four very light strokes along the opal with it. If this precaution is not observed, the support may slip and damage the print. After this, squeegee fairly vigorously in different directions, and set up to dry. When quite dry, if the waxing process has been properly done, it will shell off readily.

Some workers make a trouble of this transferring, but once understood there is no difficulty whatever in it. It has its advantages, too, one of which, the facility with which clouds may be added to a landscape, it may be as well to describe in detail. We will take it that the print just developed is such a subject, and that the sky portion is, as sometimes happens, somewhat degraded, so that clouds cannot be printed on in their true value. This being so, before we finish off the development we take a camel-hair brush and with this gently remove the film left on the sky portion. This requires careful doing against the sky-line and in spaces between trees, but such spaces may generally be left as they are. Now alum bath, finish, and dry as already described. The next thing to do is to make a mask of thin paper to cover up the parts of the print where the clouds are not required. This is best done by placing paper and negative against the window and marking the sky-line with a pointed pencil. The paper must then be cut carefully along the sky-line. Trees that stand above the sky-line may be neglected, making the cut along any solid part. We now proceed to take a carbon print off a suitable negative, and this has to be squeegeed and developed on the sky portion of our landscape. Before doing this, however, the mask is lightly

gummed round the edges, or rather along the sky-line, and placed in position on the opal. Thus it protects the landscape from the cloud tissue, and washes off during development. The mask should not be gummed on before and allowed to dry, as there is risk of its pulling off a portion of the image. If the clouds thus placed are not satisfactory they may be removed with the brush and a fresh start made. The transfer is, of course, as already described.

The method of measuring-up carbon printing by means of P. O. P. is but approximate, and not always satisfactory. The two processes are essentially different, and the effect of moisture and the continuing action in the carbon may be such as to throw the results troublesomely far apart. If a carbon print be made in dry summer weather up to a certain actinometer number in P. O. P., and a similar one made in dull, damp weather, the first will be underexposed and the latter much overex-

posed. This may, or may not, be remedied by varying the temperature of the water in development, but this is troublesome and uncertain.

In my own practice I prefer to measure the change which takes place in the carbon tissue by observing the effect of the light action on a similar piece of bichromated gelatin minus the color which is incorporated in the tissue. The darkening is not great, but it is sufficient if used behind a negative of similar density and color as described with the P. O. P. In the final support we have a suitable material, and I take a piece of this, 3 in. by 1 in., and sensitize with each piece of carbon tissue. This is dried with and kept with the tissue itself, and, being subject to and amenable to the same conditions and changes as the tissue, shows much more nearly the invisible changes which are taking place in the print. The printing on this should be carried far enough to show the detail clearly in a fairly dense part.

THE PHOTOGRAPHERS' CREED

"WE believe that this is a just world and that even photographers will get all they deserve."

"We believe that photography is a science and the practice of it an art worthy of our best thought and effort."

"Give us time to study hard and the leisure for quiet thought, and open mind toward the wisdom of seasoned experience, and a ready ear that we may hear the heart-beats of our patrons."

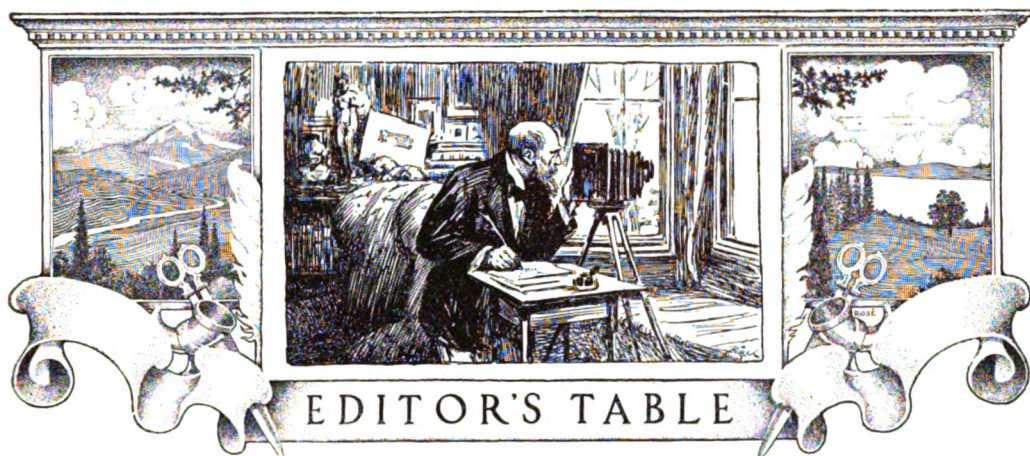
"Protect us from the cant of the unfailing system, from the temptation to knock the work or character of another, and from the necessity of advocating damnably bad photographs

at low prices in preference to good work at fair prices."

"Give us charity, good cheer, and a minute or so for the beginner and the plodder while practising at all times the noble art of minding our own business."

"Give us strength to be boosters always—kickers never—and that we may always play the game like gentlemen."

"And in the end, may God protect us from the belief that we are superior in knowledge or performance to our brothers, and find us a place in the sacred city of our ideals."



TURNING THE TABLE

BY removing the Editor's Table to a more remote corner of our sanctum, several months ago, we did so with a desire solely to utilize this space for what we considered more important material; but apparently this change was not so acceptable to our readers, and we have since had many requests to resume this department, so we take pleasure in again appearing in an "outward visible form," although the same editorial expression and direction have been in evidence.

The JOURNAL in its long career has always reflected a true and complete record of photography in America—artistic, technical, and commercial—which we mean to maintain as representative and authoritative, but we also desire very much to make this magazine more *your* magazine, full of art inspiration, and yet possessing the practical information that will produce more value and greater satisfaction to every reader.

The JOURNAL, therefore, seeks the practical coöperation of progressive photographers everywhere. It is edited and published to help the progressive—the earnest, ambitious worker. Its pages contain information and illustrations selected for this one end—to *help make easy and certain the progress of those who aspire to perfect photography.*

The editors are determined that this magazine shall continue to fulfil its purpose—increasing and extending its

usefulness for the practical photographer.

We would call the attention of every reader to the new features in this issue and we have already in hand several new series of articles which will add freshness and vigor to the contents and which are in the line of advancement—to make the best progress we need the coöperation of our readers. Will you think about it and suggest:

Some plan for a single feature, or article, or series of articles, or subject which will add to the interest or the helpfulness of this magazine *for you.*

How it can be made more attractive and valuable *to you.*

We want to hear what *you* think of what we print.

We are not unaware of the value of criticism and will always welcome any expression. This friendly and interested service cannot, we know, be secured by offer of payment, but for any suggestion we use we shall return what we believe will be an acceptable honorarium.

YOUR OPPORTUNITY

IF ever there was a time when the photographer could reasonably expect greater success to follow legitimate enterprise, that time, it seems to us, is at hand. Although every business in the land must adjust itself to this new era of trials and problems and stern economic conditions, photog-

raphy is playing a larger and more important part in every phase of undertaking than ever before—and presenting larger opportunities.

We want every photographer to realize this opportunity and to make the most of it for himself. It is a matter of infinitely more importance than any question presented at the conventions, and deserves the earnest consideration of all engaged in photography as a business.

Professional photography has seen some wonderful changes during the past few years, in methods as well as in results. It has advanced in all directions, and the public is fully informed of these advances and is appreciative of their value. Photographers, too, have not escaped the tendency toward "reform," and the "new blood" brings with it new hope and power.

Formerly, a photographer pushed his way to success by slow and patient effort, consuming years in his development. The times are changed; the man who was unknown but yesterday is known everywhere today; his patronage grows with incomprehensible rapidity, and his prices fill his forerunners with envy.

The great question is: How shall he grasp the opportunity which seems to be within reach? It is a question which must be answered by each one for himself after a careful survey of the conditions affecting *his* business. What will succeed here will not meet the requirements there. Much depends on the location of the studio; much upon the ability of the man

behind the business; but, most of all, *success will depend upon intelligent enterprise.*

Look over your business; *simplify it*; weed out the rubbish in ideas and equipment; put it into such a shape that it will everywhere respond to the new enterprise you are to infuse into it. Look over your field of patronage and measure its possibilities. Is there room for a radical departure in styles of work and prices, or will the pushing of good straight photography win most favor? Is there an opening for advertising of which you have not availed yourself in the past? Are there leaks in your present system of business which practically keep your nose on the grindstone all the time? Are your employes fully in touch with your ideas, and do they coöperate? Would not a capable business woman be more profitable in your reception-room, than the girl who now keeps the place tidy, meets customers, and fills her odd moments with retouching? Is not the time favorable for sorting out likely duplicate orders from your negative stock? Would not a good, persuasive booklet distributed in your locality be a profitable advertisement for the opening season? Can you not arrange a small but attractive exhibition of good portraiture in your rooms and throw them open to your patrons and neighbors by invitation?

These questions might be multiplied many times. We suggest them simply to open up new ideas and thoughts—to *awaken enterprise.* This opportunity for profit will bring most to those who are best prepared for it.





PRACTICAL PAPERS ON STUDIO WORK AND METHODS

The People You Photograph

ONE of the first things every photographer learns is to overcome physical defects which are common to all types of sitters. Very little studio experience is needed to teach the photographer how to avoid giving prominence to such facial defects as crooked noses, squinting eyes, etc.

Few sitters are entirely free from such defects and many ask to have the right or left side of the face towards the camera to avoid them. In nearly every case the photographer will notice some feature that is not quite as it should be, or see some skin marking that detracts from the beauty of the face.

These drawbacks are met with in all types and quite often one is compelled to use a pose and a lighting which he knows are unsuited to the type but which are the only ones possible to hide some little defects. Furthermore, a sitter may be of a type best suited for a profile or a three-quarter face picture, but her eyes may be so full of expression that it will be better to make the most of them, even if the pose is not the best for the other features. No definite and unalterable laws can be made that will apply to every sitter. General principles and their application to recognized types, however, can be discussed with profit.

Some sitters are very disappointing. There is the woman, for instance, who comes into the studio all smiles. Her features are not classical, but her happy, lively expression gives her a charm which makes up for any imperfection in the outline of her face. She is dressed with perfect taste, and, while she chats with you, you feel sure that you will get some real snappy-looking pictures—especially when she tells you that she leaves the pose and style entirely to you.

Once she gets in front of the camera, however, she is not the same woman. She becomes serious and self-conscious, and all the animation goes from her face. You then realize that her principal charm has gone, and that, unless you

can call back the liveliness into her expression, your pictures will be useless. What are you going to do when a sitter of this type comes in?

Expression is everything. You must be prepared to sacrifice much that you would like in posing and lighting for the sake of expression. A cold, lifeless map of this woman's face, however cleverly the head might be posed and lighted, would not be a portrait. She is a tantalizing sitter, and you must use your tact and patience, a great deal more than your knowledge of light and shade, to get a satisfactory picture of her.

Do not waste plates at the beginning of the sitting—make some exposures, but let them be "mahogany types." You will find that after a few "exposures" the sitter gradually gets used to being photographed, and her self-consciousness grows less apparent. Aim at getting a full, or nearly full, face position. This will help you to make use of the eyes and mouth, the features upon which so much of the expression of a face depends.

The following method has often been successful. Ask the sitter to stand or sit with her body and head turned well away from the camera, but not to a profile position. Then get her to look at a book, or draw her attention to something in front of her, such as a picture on the wall. While she is in this position stand beside the camera and ask a question on some subject which you have not been talking about, and one that has no relation to photography. Most likely she will turn her head towards you before answering. This will give you a chance to expose a plate. The pose itself suggests alertness, and the new topic suddenly introduced is almost certain to give animation to the features.

There are many sitters like this—and they are the most difficult class to photograph successfully. They are charming, but when you try to define their charms you find yourself in difficulties. It may be that they are of a lively, happy disposition, that their smile suggests kindness and good nature, or that their carriage is graceful and dignified—it may be one or all

of these, or it may be something more subtle and elusive than any of them. If the charms are difficult to define, how much more difficult must it be to reproduce them in your portraits? The more you overcome the difficulty the higher you will raise the quality of your work. The successful portrait photographer is always a keen observer of faces and a student of human character.—*Photo Digest*.

Active Preparation

You do photographic work and you have photographs to sell. The trouble with the times is that the people do not seem to want as many pictures as we have the desire to supply them with. And yet it seems that there are some galleries that are quite busy, while there are many others that complain that there is little or nothing doing, all of which would indicate that there must be some decided differences either in the personalities or the local conditions. While it does make some difference as to the nature of these causes, what is of greater moment is a little discussion of what might be done to change the conditions.

In reading over a pamphlet of an expert advertising concern we found an article that discussed the matter of advertising at long range and indicated a few of the cardinal principles that underlie all effort to get business and hold it. With the big industries these principles are made the foundation of systematic study, and the campaigns are planned to fit the individual requirements through methods selected by the various courses of reasoning. Each one goes about it in a different way, and the only measure of the virtue of each method is the success that is obtained.

The fundamental necessity of some form of advertising is the fact that the public will not buy of a certain firm unless it knows that the firm carries the goods it wants. Furthermore, no matter how honest the business man may be, and no matter how excellent and reliable the goods he sells, it will not do any good unless the public is aware of it and has an opportunity to test it. Therefore the two things that every successful merchant must do is to let the public know where it can buy certain goods and also to give them a reason for buying at one place rather than another. All of this is considered ample reason for advertising, and the next thing to do is to study how to do it best and most economically.

The systematic advertising that has been proved successful and a wise investment is based upon these five divisions of effort. We may have mentioned this before, but it will stand repeating. The steps that must be considered in every advertising campaign are:

1. Attract the attention of the public.
2. Arouse public interest.
3. Create a desire.
4. Get in touch with those who are interested.
5. Complete the deal, and make the sale.

Any advertising that is weak in any one of these divisions is weak in results. The big businesses watch every step in the advertising campaign and where they find a weak spot they

strengthen it up. The adoption of trademarks and catch phrases are the means of attracting attention. The argument, short and powerful, or the illustration, made as tempting as possible, arouses the interest and creates a desire. The offer of some special inducement, or the giving of some attractive literature, or the promise of further information to those who apply get the contact between the seller and the buyer. Then good salesmanship must complete the transaction as soon as the probable buyer is interested and within reach. It is a pretty theory, and it is just as pretty a problem to work it out successfully. If you do, you make by it. If you do not even try it, or do not work it out properly, it is a loss. If you want to succeed nowadays, you must do it in some form. So select your method of doing it and take a try. Do not say that you cannot succeed in it until you have tried. We all want some business between now and Christmas and we will have to hustle to get it. Let's hustle some.—*Trade News*.

How Many Positions?

IN spite of the enhanced prices of plates, paper, and, in fact, all photographic material, there is a growing tendency for photographers to offer their patrons a larger number of positions than was formerly considered necessary. Many of us can remember when it was quite usual to see on a card of terms the words: "six copies (one position)," and "twelve copies (two positions)": beyond that the imagination of the photographer did not go. Possibly he might have given three positions with an order for two dozen prints, but he rarely, if ever, told the public so. Now we have some photographers submitting six proofs with an order for a half-dozen prints, and, if desired, retouching all the negatives and supplying one finished print from each. This may, at the first glance, seem to be an extravagant way of doing business, but in practice it is not so, for after seeing the proofs it is a very rare occurrence for a small order not to be increased. Hence, from a business point of view, it is more profitable than making two exposures and supplying no more than the half-dozen originally ordered. Naturally, one must look to the receptionist to make the best of the possibility of increasing the extent of the order when the sitter returns the proofs, and it is obvious that this can only be done where the clientele is of fairly good class. In a working district a couple of good, bright proofs are all that is required, as the sitter has usually predetermined what he or she can afford to spend on portraits.

Another advantage of giving a good number of poses is the reduction in the number of re-sittings which always results. Re-sittings are unpleasant to both photographer and sitter, no matter how amiable each may be; very often the customer grudgingly accepts portraits rather than suggest another sitting. There are, we know, some few sitters who make up their minds beforehand that they will have a re-sitting, no matter how good the proofs may be,

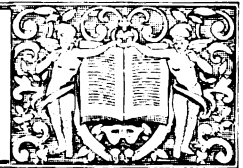
but such folk cannot be better dealt with than by being given a good choice in the first place, and an intimation that a re-sitting will only be given free when a very good reason exists. The photographer who cannot please a client with one or more out of half a dozen poses has much to learn, and should immediately set to work to find out why his pictures fail to please. Monotony must be avoided at all costs: six poses with nothing but a slight turn of the head or a trifling variation in lighting will not necessarily prove acceptable. The form in which proofs should be submitted is a matter for careful consideration, whether untuned prints from untouched negatives, untuned prints from slightly retouched negatives, or finished prints mounted so that they can be counted as part of the order. The general consensus of opinion favors the middle course, the most obvious defects being removed by the retoucher, and lightly printed P.O.P. prints made, without toning. These are sent with an intimation that any desired alterations should be indicated upon the selected poses in ink or soft pencil. It is then quite easy for the sitter to point out where

she considers that the coiffure may be altered, the drapery modified, the size of the mouth reduced, and so on. This can safely be left to most fashionable sitters, who are fully aware of the powers of the retoucher, and are, if anything, more likely to over-rate his powers than to ignore them. This knowledge often avoids a re-sitting. If the nose looks too large, and the sitter knows that the knife can be used, all that is necessary is for her to say so upon the proof.

The only argument against submitting a liberal number of proofs is to be found on the score of expense. Plates are costly now, but they hardly reach the prices ruling when gelatin came into use. In the majority of cases, eighteenpence would cover the extra outlay on an average sitting, and if this not only minimizes re-sittings, but increases the volume of business, the investment is a sound one. We have not counted the cost of extra retouching, nor the operator's time in exposing and developing, as there are few studios in which, except at Christmas or "local seasons," the staff is kept fully employed all the time.—*British Journal of Photography*.



IEWS AND REVIEWS



The Work of C. Crowther

IN our issue of January last appeared reproductions of the work of Mr. C. Crowther, of Japan, whose work is gaining deserving distinction and we are pleased to be able to show our readers some of his more recent prints. Mr. Crowther has recently been elected a Fellow of the Royal Photographic Society of Great Britain. He is one of those keen workers who, in spite of being separated from their native country by many thousands of miles, continue to produce good work with unabated enthusiasm for the mere love of it, which is all the more praiseworthy owing to the lack of local competition. This is the true spirit, and this worker has already by means of his camera been able to contribute a considerable sum of money to the National Relief Fund in connection with the war. Mr. Crowther's work is quite individualistic in character, and special attention is directed to the pose and lighting of his subjects. Speaking of his methods he writes:

"For many, many years I have worked at photography with more or less interest, and can only conclude that my recent work in portraiture and the acknowledged qualities my pictures contain are an unconscious application and development of my past experiences. I am quite unaware of any special effort or straining to do any more than portray the character of my sitters.

"My work is doubtless different from the

usual style of the professional photographer, but I believe is in keeping with that of advanced workers in the British Isles and the United States."

"Collodion, and the Making of Wet-plate Negatives for Photographic Work"

This is a handbook of information concerning the production of wet-plate negatives by simple and sure methods. In response to many requests and in keeping with the "Eastman Service," they describe the way in which Eastman collodion should be used in photo-engraving work. This booklet is valuable to anyone interested in the subject, and will be mailed on application to the Eastman Kodak Co., at Rochester, N. Y.

"Making Money with the Camera"

Is the title of this recent issue (No. 163) of *The Photo-Miniature*, full of ideas, suggestions, and methods for making spare-time money with photographic specialties, for amateurs or professionals. It gives dozens of methods by which any photographer can add \$100 to \$2000 a year to his income, with very little effort—practically spare-time work. There is the actual fact or experience behind every idea, plan, assertion and figure given in the book. It is big value for little money—25 cents, through your dealer or Tennant & Ward, 103 Park Ave., New York City.

Military Airplane Photography

As early as 1850 Captain de Laussedat, of the French Engineer Corps, suggested the use of photography for surveying, and as a direct result of his work attempts were made to take photographs from captive balloons even prior to the Civil War. Although at that date the art of photography had not sufficiently advanced, nevertheless photographic surveying soon became a success, even with the wet-plate process, and with the introduction of the dry-plate the method was adopted by a number of governments. When military airplanes came into use the value of photography for correct location and delineation of objects was well understood.

The primary object of airplane photography is to obtain a complete and perfect record of that part of the terrain seen from an airplane; another object is to obtain a record in large enough scale to permit the recognition of most of the points of importance; while a third is to permit the placing of the various objects seen on the photographs in their true location on the map. The employment of dummy guns, tree branches, paint, etc., to create a false impression was practically coincident with the development of airplane photography. One result of such photographs has been to change entirely the manner of placing field-guns. Now, a well-marked gun-pit does not necessarily denote the presence of a gun, as there may be found three or four well-marked gun-pits to each gun in actual use.

In the European war it has been found advantageous to obtain records from day to day of the holes made by high explosive shells which may be available for cover in carrying out attacks. This led to photographs large enough to permit of the closest possible identification in the negative or print. Until quite recently the average scale of military photographs was about $\frac{1}{5000}$ actual size. Since this is the scale of a true horizontal photograph with a 12-inch lens at 5000 feet elevation, with the increased range of anti-aircraft guns, in some instances, lenses of extreme focal length were used. In practice, placing all enemy positions in their true location on the map has resulted in the location and destruction of field-guns a few hours after a photographic reconnaissance flight.—A. BROCK, JR., in *Aviation*.

A New Noiseless Studio Shutter

THE Eastman Kodak Company has just put on the market a new studio shutter, for Century and Folmer & Schwing cameras only. It is called the F. & S. Studio Shutter, and has been designed to meet the demand for an exposing mechanism of simple and durable construction that will operate with an extremely silent and positive action, permitting the operator to give his undivided attention to the subject. The shutter requires no setting, and the curtains are rapidly and silently actuated by means of a rubber bulb and tubing. The shutter is now ready for distribution for 8 x 10 and 11 x 14 cameras. There is a folder giving further details which will be supplied on application.

A New "Ensign"

THE firm of G. Gennert has placed upon the market a camera with a new equipment which is an addition to the already complete line of hand cameras of the well known Ensign make. At the moment the camera is supplied in 3A size only. It is a compact, round-end model, leather-covered. Particular attention should be called to the advantage of the U-shaped front with which this camera is equipped. It is fitted with an Ilex General Shutter, which is noted for its accuracy and excellent make, and with an $f:7.5$ anastigmat lens. The cells are specially ground anastigmatic lenses of a speed of $f:7.5$, which are sufficiently fast enough for excellent work of the advanced amateur as for the ordinary camera user.

We take pleasure in recommending this camera to anyone who wishes an outfit of this kind.

"How to Make Portraits"

THIS is a new and thoroughly revised edition of a popular handbook, in Practical Photography Series, and while largely intended for the amateur there are many hints for the professional. This is published in both cloth and paper, the price being respectively 50 cents and 25 cents. Copies supplied through this office.

A Full Supply of Autochrom Plates

WE are advised by R. J. Fitzsimons, 75 Fifth Avenue, New York, that while at times during the past year he has been out of stock of some sizes of Autochroms, the factory in France has so far overcome its difficulties of production that he now has a full stock of all sizes and anticipates that he will be able to take care of fall business without difficulty or delay.

A Timely Suggestion

THIS is the time when every man in the army and navy will want a photo-case, and this is a timely opportunity for photographers to increase their business by specializing in this war-time suggestion. Attention is called to the new and fine line of photo-cases and metal photograph frames manufactured by the L. H. Cohen Co., 28 East Twenty-second Street, New York City.

These photo-cases are extra thin and made of long-grain leather lined with moire silk, in oval or square opening. Folds flat for the pocket and specially designed to contain the photograph that will give comfort and consolation to every man in the service. The prices are reasonable and it will pay you to send for their latest catalogue A.

A Bit of Advice from Alfred Stieglitz

"In my opinion the most difficult problem in photography is to *learn* to see. All else is comparatively simple, and one can only learn to see through comparison, through contrast. That is every artist's greatest secret."

Announcement of the Pittsburg Salon of Photographic Art

THE Fifth Annual Salon, Carnegie Institute, Department of Fine Arts, Pittsburg, Pennsylvania, will be presented during the month of March, 1918. Last day for receiving prints, February 9, 1918.

Salient features of Pittsburg Salon: No expense to contributors except carriage to Pittsburg; all work submitted will receive careful consideration by a committee of pictorial photographers; only work not exhibited before in this country will be accepted; pictures to be sent mounted but unframed; all work accepted will be shown under glass.

Pittsburg is fortunate in having at their disposal the finest exhibition quarters in the country, in the midst of one of the finest art collections in America, and visited by more people than any salon in any city of the United States. Gallery is open daily, 10 A.M. to 10 P.M. Sundays 2 to 6 P.M. Free to the public.

The officers of the Pittsburg Salon present these exhibitions for the advancement of pictorial photography, no mercenary motives prompting their work. It is guaranteed by contributing members who are the best artists in pictorial photography. New workers are especially invited to send work. Entry blanks later on application, and final announcements will appear in all photographic journals later.

C. E. BEESON, Secretary.

700 Union Arcade Building, Pittsburg, Pa.

Ninth Congress of Photography

CEDAR POINT, OHIO.

August 3, 1917.

THE following is a resolution adopted at the Ninth Annual Convention of the National Congress of Photography, in session at Cedar Point, Ohio, endorsing accredited Photographic Schools.

TO WHOM IT MAY CONCERN:

WHEREAS, The photographic profession would be greatly served by a close coöperation between the P. A. of A. and the photographic schools; and

WHEREAS, There has not been any of this coöperation in the past.

Resolved, That any photographic school which shall confine its diplomas to those students who shall specialize in one of the different departments of studio work, such as printing, retouching or operating, and who shall have pursued a course in which he specializes of not less than six months' duration, and for which the diploma is granted; said schools shall be rated as accredited institutions by the Photographers' Association of America; be it further

Resolved, That the executive board of the P. A. of A. shall be empowered to issue letters of credit to schools which comply with the above requirements, and also be empowered to withdraw such letters of credit when such schools fail to comply with the requirements upon the compliance of which the letters were granted.

Eastman Commercial Film

ANNOUNCEMENT of the new Eastman Commercial Film will be of special interest to the many commercial photographers who have found Portrait Film a decided advantage, convenience and economy in much of their work, but it should also be of general interest. Commercial Film has about the same speed as the Seed 23 plate and may be used for the same classes of work. Its contrast is between that of Portrait and Process Film and it will be found especially useful in copying and all similar classes of work requiring slightly higher contrasts than can be secured with faster emulsions.

There is an advantage in the slow emulsion due to the latitude in handling. While the maximum contrast is high, a low contrast can be secured with less than normal development, and if exposure has been short, development can be forced to a higher contrast without fogging than is possible with faster emulsions.

Aside from its special advantages as a slow, contrasty, fine-grained film for copying or making positives from which duplicate negatives are to be made, it has the same non-halation properties as all film and the same physical advantages of lightness, compactness, flexibility, etc. These advantages are great when a considerable number of valuable negatives or positives must be stored and guarded against breakage, etc.

The Brooklyn Institute of Arts and Sciences, Department of Photography, Academy of Music Building

Proposed Events of the Department of
Photography

Season of 1917-1918

Loan Exhibition of Prints

Monday, October 15; Monday, November 12, and Monday, December 10, 1917. Monday, January 7; Monday, February 4; Monday, March 4; Monday, April 1, and Monday, April 29, 1918.

Saturday, April 27, 1918. Twenty-eighth Annual Exhibition.

Demonstrations

October 12, November 2, November 23, and December 14, 1917. January 4, January 25, February 15, March 8, March 29, and April 19, 1918.

Lectures on Photography and Criticism

December 7, 1917. January 18 and March 1, 1918.

Classes

(Advanced Classes)

Instruction in Art Photography. October 4 to April 4, 1918, first Thursday evening in each month and five Saturday afternoons at studio work under the instruction of Clarence H. White.

Instruction in Rudiments of Photography

October 2 to April 23, on Tuesday evenings.

Beginner's Class, first and third Tuesdays.

Advanced Class, second and fourth Tuesdays.

Also four afternoons in field work and ten demonstrations by William H. Zerbe.

Advanced Class Instruction in Art Photography

Recognizing the broadening influence of artistic photography in portraiture, magazine illustration, and as a medium of art expression, the department of photography of the Brooklyn Institute of Arts and Sciences has again secured the cooperation of Mr. Clarence H. White, of Columbia University.

This course will consist of twelve sessions, beginning October 4, 1917, and ending April 4, 1918. The class will meet on the first Thursday evening in each month, and there will be five Saturday afternoons at studio work.

Anyone interested in photography living near New York and Brooklyn will be well repaid by attending this special course, which is open to beginners as well as advanced workers. It is an unusual opportunity for all photographers.

The cost of tuition for members of the institute is \$10 and \$14 for all other persons.

Write for prospectus giving full particulars. Address the Brooklyn Institute of Arts and Sciences, Academy of Music, Brooklyn, New York, or Mr. Clarence H. White, 230 East 11th Street, New York City.

The Death of Mr. W. I. Iliffe

WE deeply regret to have to record the death of Mr. William Iliffe, the founder and senior partner of Iliffe & Sons Ltd., the proprietors of *Photography* and *Focus*. Although for some years past he had taken no very active share in the management of the business, which owed so much to his foresight, his keen interest in all connected with it was maintained to the last.

Latterly his health had been failing, but he was able to follow his usual pursuits almost uninterruptedly, dying in his sleep on the morning of July 5th at the age of seventy-four.

Preventing the Taking of Two Pictures on the Same Film

WITH a view to eliminating all possibility of double exposure through not winding the film, Clarence A. Hoyt, of Tacoma, Washington (according to the *Scientific American*), has invented a device which prevents a picture from being snapped until the film has been turned. When adapted to the box type of camera a catch locks with the shutter-release lever after an exposure is made, and in order to unlock the lever it is necessary to first turn the film. It is also possible to make the device indicate whether the film surface in position has been exposed or not by means of a window in which appears the word "Exposed" or "Unexposed," as the case may be. A device of this kind, so far as the automatic locking of the shutter until the film has been wound is concerned, is, however, not new.

How to Increase Profits. Have a Bonfire

Do you want to make more money? Do you want to please your customers? Do you want to get more people in your reception-room, and in your studio? If so haul down those old frame pictures that have been on the walls of your reception-room "lo! these many years." Take them out in the back yard and have a bonfire. Then redecorate your reception-room and put up a few new up-to-date pictures and frames. Business will soon improve and you will wonder what caused so many to come to your studio. *Simply because you are up-to-date.* There are a number of first-class enlarging houses who have artists who will make you up-to-date prints. Hang a few of these in your reception-room and you will soon find that it is a great deal easier to take orders. It might be well for you to pull the pictures out of your showcases and in some cases take the outside case down and burn it with the rest.—*Ohio Photo. News.*

The New "Verito"

THE new Verito lens with diffusing stops for enlarging has proven a wonderful success where the photographers have taken pains and learned how to use the same. Enlargements have a rare pictorial quality which cannot be obtained by any other lens. The prints of C. Crowther, shown in this number, were made with a "Verito." Mr. Crowther writes us that he seldom does any retouching.

Proofs

How many photographers take care of the question of proofs from a business standpoint?

Many of them do not realize that the proofs they submit to their customers are their merchandise, and should be handled absolutely from a business point of view.

The photographers who do business with the cheaper class of trade get the best results, for they invariably make their customers understand that the proofs must be reported upon, otherwise they have to be paid for, and as they always get a deposit at the time of the sitting, the customer does not want to lose this; hence they get paid for their work.

In the better class of studios, where credit is given, many of the photographers seem to be afraid to ask about the proofs after a certain length of time and I have known many instances where the customer has never reported on them; the photographer being out not only his time and materials, but is carrying on his books a prospective customer who does not produce results.

At the present time, where the question of materials is of vital importance, it behooves the photographer to take care of his business from a practical standpoint, and as his proofs are what he depends on for his orders, they should be given the closest attention, in fact, it is as necessary to do this as it is for him to take advantage of his discounts.—*The Professional Photographer (U. S.).*

David Stern Company Moves to Larger Quarters

THE David Stern Company, of Chicago, announce the recent removal to their new four-story Davesco building at 1027-1029 Madison Street.

A modern dark-room is equipped on every floor and a testing-room with lens charts, etc., on the second floor are new innovations.

Every camera and lens will be carefully tested before it is shipped, assuring the purchaser an accurate photographic equipment.

A large and constantly moving stock of cameras, lenses, plates, paper and other accessories will enable them to ship mail orders without delay.

This Company have our best wishes for increased business.

"Emergol" as a Substitute for "Agfa" Metol

HAVING now had three years of the most severe tests, by the photographic trade in general, "Emergol" is offered as the nearest approach to the German "Agfa" Metol. Suitable formulæ is given with the product, but it has been found to work most satisfactorily when used in like proportion as given in any formula calling for Metol.

John I. Hoffman Resigns from P. A. of A.

JOHN I. HOFFMAN has resigned as secretary of the P. A. of A. to take effect on September 1. He becomes Assistant Secretary of the International Association Rotary Clubs of Chicago, Ill.

Mr. Hoffman succeeded in building up the organization and placed before photographers many ideas that have been a benefit to them. He is succeeded by Charles J. Columbus, of Washington, D. C.

Get the Soldiers' Business

MANY photographers are taking advantage of the opportunities for business offered by the recruiting of men for our army and navy, the national guard and officers' training camps.

We know of one photographer who expects to photograph every man who enlists from his town, and he will probably do it, for he is pulling every string that has an end long enough to get hold of.

He is advertising in the motion-picture houses and the newspapers, asking the public to watch his show window for pictures of the boys who are enlisting. The newspapers have agreed to publish his pictures of the recruits in one of their issues, and we have no doubt that he will get the business and a considerable amount of advertising as well.

The immediate profit is the important thing and it should be a good profit. The advertising, however, is also important, for there will be much more of this business, and the man who gets it coming his way will find it easy to keep it coming.

—*Photo Digest*.

· BREVITIES ·

Photographic Subjects in Leading Periodicals

"A Bibliography for Color Photography," by A. S. Cory, *Motion Picture News*, July, 1917, p. 298.

"Additions to Emulsion," by W. E. Debenham, *British Journal of Photography*, 1917, p. 319.

"Color Vision and Color Photography," by C. W. Piper, *British Journal of Photography*, 1917, p. 21.

"Reaction of X-ray on Plate, Pastille and Skin," by J. Remer and W. D. Witherbee, *American Journal of Roentgenology*, June, 1917, p. 302.

"Mounting on Metal," *Studio Light*, June, 1917, p. 20.

"Home-made Transparency Plates," by W. E. Debenham, *British Journal of Photography*, 1917, p. 289.

"Methods of Determining Exposure," *Motion Picture World*, June, 1917, p. 2094.

"Intensifying Negatives," by C. E. K. Mees, *Kodakery*, July, 1917, p. 21.

"Warm Tones Direct in Development," *Fotografen*, April, 1917, p. 16.

"The Photographic Rendering of Tone Values," by C. E. K. Mees, *Studio Light*, June, 1917, p. 3.

"Maintaining Photographic Standards," by A. B. Hitchins, *Journal of the Franklin Institute*, August 1917, p. 179.

"Tank Plate Making," by A. O. Forrest, *British Journal of Photography*, 1917, p. 291.

"The Grain in Photographic Plates and a Method for its Investigation," by P. P. Koch and G. du Prel, *Chemical Abstracts*, 1917, p. 318.

"Some Simple Lens Arithmetic," by B. E. Havelock, *British Journal of Photography*, 1917, p. 298.

"Landscape Photography," *Photo Miniature*, April, 1917.

"Enlarging with a Hand Camera," *Kodakery*, July, 1917, p. 24.

"Photographing Wild Flowers," *Kodakery*, July, 1917, p. 10.

"Restoring Scales," *British Journal of Photography*, 1917, p. 294.

"An Easy Method of Constructing a Focussing Scale," by E. Senior, *British Journal of Photography*, 1917, p. 313.

"The Bromoil Process," by Brum do Canto, *British Journal of Photography*, 1917, p. 306.

"Enlarging Accurately to Scale," by A. Lockett, *British Journal of Photography*, 1917, p. 297.

"The Photographic Production of a Lithographic Key on Zinc and Aluminum," by J. I. Crabtree, *National Lithographer*, 1917, p. 45.

"Photomicrographs in Color," by C. E. K. Mees, *American Photography*, Aug. 1917, p. 448.

"A Photochemical Theory of Vision and Photographic Action," by P. G. Nutting, *Journal of the Optical Society of America*, January, 1917, p. 31.



THE WORKROOM

By the Head Operator

HOW TO UTILIZE WASTE MATERIAL
 SENSITIZING JAPANESE PAPER FOR PRINTING-OUT OR DEVELOPMENT
 GIVING PHOTOGRAPHS A CANVAS-LIKE SURFACE
 COLORING PHOTOGRAPHS
 PHOTOGRAPHURE PLATE MAKING AND PRINTING
 MAKING ENLARGEMENTS
 CORRECT EXPOSURE
 DIFFUSED LIGHT AND DIRECT LIGHT, AND SOME FACTS IN PRACTICE

WASHING POST-CARDS
 SODIUM SULPHITE CRYSTALS
 DIFFUSING THE IMAGE IN FIXED-FOCUS ENLARGERS
 AN ECONOMIC NOTE
 NICKEL-PLATED FITTING
 IMPROVING BROMIDE ENLARGEMENTS WITH GOLD
 ELIMINATING HYPO
 THE USE OF SUPPLEMENTARY LENSES
 RETOUCHING
 RANDOM NOTES

How to Utilize Waste Material

RUINED negatives are undoubtedly the greatest waste by the photographer. The uses to which it may be put are many-fold. Cut the glass so that it will measure $3\frac{1}{4}$ inches square and the films cleaned off, they will make excellent cover-glasses for lantern slides.

Take a spoiled negative, dissolve off all the silver with a solution of potassium ferricyanide and hypo. Rinse, dry, rub with sandpaper, the result will be a splendid ground-glass.

Take another negative and repeat the dissolving of the silver, but this time wash thoroughly. Squeegee down on this a print, and an opaline will be the result.

Users of pyro, instead of throwing the old developer away, should keep some of it and allow it to oxidize. A thin negative, if immersed in this for a few minutes, will be stained a deep yellow all over, and its printing quality will be much improved.

Flash-powders to be ignited by simply applying the flame of a match or laying on an oiled paper and igniting that, may be made by the following formulas:

I	
Magnesium	6 parts
Potassium chlorate	10 parts

II	
Aluminum	4 parts
Potassium chlorate	12 parts
Sugar	1 part

The ingredients in each case are to be powdered separately, and then lightly mixed with a wooden spatula, as the compound may be ignited by friction and burn with explosive violence.

It is best to make only such quantity as may be needed for such use at the time, which is 10 or 15 grains.

To Restore Faded Photographs

1. As a precaution against a mistake first copy the old print in the same size. Soak the faded photograph for several hours in clean water

and, after separating print from mount, immerse the former in nitric acid, highly dilute (1 per cent.), for a few minutes. Then the print is kept in a mercury intensifier (mercuric chloride $\frac{1}{2}$ ounce; common salt $\frac{1}{2}$ ounce; hot water 16 ounces; used cold), until bleached as much as possible. After an hour's rinsing, a very weak ammonia solution will restore the photograph, with increased vigor, the upper tones being much improved, though the shadows will show some tendency to clog. The net result will be a decided improvement in appearance; but, at this stage, any similarly restored photographs should be recopied if their importance warrants it, as mercury intensifier results are not permanent. It may be suggested that merely rephotographing and printing in platinotype will probably answer.

2. Carefully remove the picture from its mount, and put it in a solution of the following composition.

	By weight.
Hydrochloric acid	2 parts
Sodium chloride	8 parts
Potassium bichromate	8 parts
Distilled water	250 parts

The fluid bleaches the picture, but photographs that have been toned with gold do not vanish. Rinse with plenty of water, and develop again with very dilute alkaline developer.

The Recovery of Gold from Photographers' Solutions

In reclaiming old gold solutions, all liquids containing gold, with the exception of baths of which cyanide forms a part, must be strongly acidulated with chlorhydric or sulphuric acid, if they are not already acid in their nature. They are afterward diluted with a large proportion of ordinary water, and a solution of sulphate of ferroprotoxide (green vitriol) is poured in in excess. It is recognized that the filtered liquid no longer contains gold when the addition of a new quantity of ferric sulphate does not occasion any cloudiness. Gold precipitated in the form of a reddish or blackish powder is collected on a filter and dried in an oven with weights

equal to its own of borax, saltpeter, and carbonate of potash. The mass is afterward introduced gradually into a fireproof crucible and carried to a white-red heat in a furnace. When all the matter has been introduced, a strong blast is given by closing the furnace, so that all the metal collects at the bottom of the crucible. On cooling, a gold ingot, chemically pure, will be obtained. This mode of reduction is also suitable for impure chloride of gold, and for the removal of gilding, but not for solutions containing cyanides, which never give up all the gold they contain; the best means of treating the latter consists in evaporating them to dryness in a cast-iron boiler, and in calcining the residue in an earthen crucible at the white-red heat. A small quantity of borax or saltpeter may be added for facilitating the fusion, but it is not generally necessary. The gold separated collects at the bottom of the crucible. It is red, if saltpeter is employed; and green if it is borax.

Sensitizing Japanese Paper for Printing-out or Development

PHOTOGRAPHS today are produced upon many kinds of material; most of them are turned to commercial account. There is one kind of paper, however, that will yield beautiful photographs that is not generally known except to those who have worked the carbon process, a paper of a delicate cream color known as Japanese paper. This paper is well suited for photographic work, no matter whether it is used as a transfer paper for carbon work, prepared and sensitized, or as a developed paper. Prints made upon this material, by direct printing, are scarcely distinguishable from carbon prints.

Sheets of different thicknesses, about 20 inches by 30 inches can be obtained and prepared in the following way:

Salting the paper: Make up the following albumin salting solution (be sure and use distilled water in the making-up process):

Chloride of ammonium . . .	120 gr.
Chloride of sodium . . .	120 gr.
Distilled water . . .	30 oz.

Shake the mixture until the salts are dissolved; now make up the following:

The whites of three eggs equal to . . .	3 oz.
Distilled water . . .	3 oz.

Beat this mixture into a well broken-up mass for five minutes with a silver-plated dinner-fork (the ordinary tin whisk egg-beater must not be used for this work). When the mass has been well beaten pour it into the salt mixture, then place the hand over the wide-mouthed bottle and shake the whole vigorously, so as to secure thorough incorporation. Allow this mixture to stand for twelve hours, then it will filter freely through a double thickness of wetted cheesecloth, in the first place, and secondly through a tuft of wetted absorbent cotton; arrange the filtering so that no air-bells are found. The salted mixture must now be

poured into a clean tray and the sheets of paper carefully floated upon the surface for three minutes. Occasionally lift the paper by one corner, to ascertain that no air-bells are formed; if they are, use a quill camel-hair brush, dipped into the salting mixture and wipe over the spot, then return the folded paper to the solution. At the end of three minutes lift the paper from the solution and let it drain cornerwise over a glass funnel, where it must be suspended by two clean wood-clips upon a stretched line to dry, away from dust and dirt.

When the paper has become thoroughly dry, mark the back of the sheet with a black lead-pencil; do not use the indelible ink pencil because the violet mark will penetrate the paper and spoil it. Roll the paper upon a cardboard tube, face *outward*; always using a pair of clean white cotton gloves when this is being done, so as to prevent the fingers from touching the surface. Paper thus salted will keep any length of time before sensitizing.

Having a number of sheets prepared make up the sensitizing solution as follows:

Distilled water	30 oz.
Recrystallized nitrate of silver . . .	4 oz.
Citric acid (crystals)	1 oz.

The nitrate of silver can be dissolved in 20 ounces of water, the citric acid in 10 ounces; then add the acid solution to the nitrate of silver, shake the mixture well; then filter it through a tuft of absorbent cotton, in a glass funnel. The sensitizing solution is now ready for use.

Sensitizing the Paper

Pour the acid silver solution into a clean porcelain or glass tray, in a room lighted by yellow light only; place upon the surface of the liquid one of the sheets of salted paper, the salted surface upon the liquid, holding the paper by opposite corners, so as to allow the middle to touch the liquid first, then lower the ends. By this means no air-bells will be found. If the paper has a tendency to lift or cockle, place a clean wood clip upon that part, for a short time, when the sheet will lie flat. Allow the paper to remain upon the liquid for three minutes, or three and a half, when it may be lifted and drained from one corner; allow the drippings of silver solution to fall into a glass funnel, placed in a wide-mouthed bottle. These drippings can be returned to the original solution and filtered again for use. As soon as the paper is perfectly dry it may be rolled up or cut into the sizes required. Always make a light leadpencil mark upon the back of each sheet, otherwise it will be difficult to tell the sensitized surface.

The sensitizing solution will become slightly discolored after use; this will not affect the sensitizing qualities. The paper prepared as above will keep well for many weeks. The Japanese vellum is an excellent paper to use. The resultant image can scarcely be distinguished from a photogravure.

Preparing the Emulsion for Developing Paper

The formula here given will be found to answer well. It is not extra rapid, but gives a brilliant clean image.

Enrich's hard gelatin	2 oz.
Distilled water	10 oz.
Chloride of ammonium (C.P.)	108 gr.

Place this in a clean stoneware crock, allow it to soak for half an hour, then place the crock into a saucepan with cold water about 3 inches deep; bring the water to boiling-point; stir the gelatin mixture with a strip of glass, add these to (under a ruby light) the following, heated to 120° F. in a clean glass flask.

Distilled water	10 oz.
Nitrate of silver	252 gr.
Citric acid (powdered)	30 oz.

This must be added slowly, the mixture being well stirred during the addition. As soon as the mixture is complete, remove the crock from a saucepan, stand it aside to become cooled; when quite cold and the emulsion is well set it must be broken up and washed in the following manner:

Under a ruby light, place a piece of the emulsion in the center of a folded piece of white mosquito netting previously wetted and wrung dry; twist the netting tight with both hands until the emulsion squeezes through in shreds; let this fall into another crock of clean water. When all the emulsion has been thus treated, tie over the crock two thicknesses of washed cheesecloth; turn the crock over, so that all the water drains off; repeat this washing with the fresh water ten or twelve times, allowing a little time to elapse between each washing. As soon as the last washing has taken place, let the emulsion drain for half an hour; now place the crock with its contents into hot water; when melted, add 1 ounce of pure photographic alcohol (no other kind), stir the mixture well and filter through absorbent cotton pressed into the small end of a clean kerosene lamp-glass, over which has been tied a double thickness of cheesecloth; allow this to filter into a small earthenware pitcher, or milk jug, when it is ready for use. Have the paper cut to suitable sizes, say 8 inches wide and the length of the sheet.

Pour the hot emulsion into a clean, warm porcelain tray, clip the ends of the paper with some light wood strips and the well-known photo-wood clips; then hold the paper in such a position that it is shaped like the letter J; allow the lower end to touch the emulsion; then by raising the left hand and lowering the right at the same time the surface of the paper becomes evenly coated with the emulsion; return the paper over the emulsion from left to right; drain the excess from one corner, so that no air bubbles are found; then wave the coated sheet in the air until the emulsion has become set; then place it in a clean light-tight closet to dry. When a number of sheets have been so coated, and the emulsion used up, allow them to dry, when they may be cut to the sizes required.

Any of the modern developers for gaslight papers may be used for development. The following one answers well:

Hot distilled water	15 oz.
Metol	20 gr.
Hydrochinone	40 gr.

Shake the mixture well, then add

Sulphite of soda (granulated)	140 gr.
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Let this dissolve, then add

Carbonate of soda (granulated)	120 gr.
Cold water	17 oz.

Also 30 to 40 drops of a 10 per cent. solution of potassium bromide, made by dissolving half an ounce of potassium bromide in 5 ounces of water. The fixing bath being made up as follows:

Hyposulphite of soda	6 oz.
Water	20 oz.

Add this to the following mixture:

Common alum	2 dr.
Water	10 oz.
Sulphite of soda	$\frac{1}{2}$ oz.
Acetic acid	$\frac{1}{2}$ oz.

The prints must be dipped into an acid solution direct from the developer before placing into the fixing bath, or stains will appear, and the fixing bath become spoiled; after fixing, the prints must be well washed, and dried or mounted wet according to taste.

Thirty grains of hydrochinone and 30 grains of metol will make the developer more energetic and give a different color.

Giving Photographs a Canvas-like Surface

AMONG the various surfaces which can be given to photographic prints are those which have the appearance of fabric, such as canvas; and few exhibitions of any importance are held which do not contain at least a few pictures which show this effect. It can be obtained with almost any printing method, and is sometimes a distinct advantage. It is not to be recommended merely because painters use canvas, and so it may be supposed to be more "artistic," nor must it be supposed that the use of such means conveys any artistic quality; but there are occasions when the broken character of a canvas surface is distinctly helpful, causing empty spaces both in the shadows and high-lights to seem less empty than they do when the surface is smooth, and compelling the spectator to view the picture from some little distance, which the photographer may realize is necessary to give the effect he designs.

The method by which the picture is given a canvas surface will depend upon circumstances. Before the war it was possible to buy canvas coated with bromide emulsion, so that enlargements could be made direct. There was no

intrinsic difference between its use and that of ordinary bromide paper. There were also bromide papers which had a canvas-like surface. Some of these may still be obtainable, but the war has cut down very drastically the variety of materials at our disposal.

Then there are methods by which the finished print can be given such a surface. If it is on thin paper, we may put it face downward on a pad made of a few sheets of newspaper, put behind it a piece of canvas, back this up with a stiff smooth card, and screw up the whole in a letter-copying press, or even place it underneath some heavy weights. The longer it can be left like this the more perfectly will the canvas convey its characteristic surface to the print. It will not do to put the canvas on the face of the print, as then the canvas effect, instead of being in relief, will be in intaglio. With very great pressure the result could no doubt be got at once; but the amateur will find that with the pressure he has at his command time is required, and if the print can be left in contact with the canvas for a week or two it is all the better.

There is another plan which has been suggested, but is hardly to be recommended, since it does not break up the surface in the way which the canvas is used to obtain, but only gives a superficial imitation of such an effect. This is to make a negative of a canvas surface, and either to print through this as well as through the ordinary negative, or else to give the print a supplementary exposure through the negative of the canvas.

It is chiefly for enlargements that a canvas surface is of use, as, unless the picture is a big one, the coarse grain of the fabric is much too aggressive; but the pressure method is applicable, of course, to a print on thin paper by any process. It is not likely, however, to be required for prints by such a process as P. O. P.

Canvas effects with the carbon process present no special difficulty. There used to be a very stout white single transfer paper having a canvas-like surface, which for some large work was very suitable; and there may be other papers which can be used. It may not be known generally that any paper that does not positively fall to pieces on wetting can be used as the support in the single transfer process, by being sized for the purpose; the sizing confers an increased strength, so that even material of the character of a blotting paper can be used. The solution generally used for the purpose is one of 1 ounce of gelatin to the pint, chrome alum being added to harden it. By soaking that weight of gelatin in about $\frac{3}{4}$ pint of cold water, and dissolving 20 grains of chrome alum in the rest of the water, standing the two liquids in a vessel of hot water until both are quite warm and the gelatin has dissolved, the chrome alum can be added to the gelatin without causing precipitation. Such a mixture is applied while still warm, either by brushing it over the paper, or by immersing the paper in it, and then fastening it up to dry. We have not tried it, but it is quite possible that with one or more coats of some such mixture even canvas itself could be utilized.

The mere mounting of a print on canvas will

sometimes give a very fair canvas-like effect, but to secure this it is evident that the paper must be thin and must be limp enough to be pressed well into the recesses of the canvas, and allowed to dry under pressure. If it is merely put up to dry, exposed to the air, the paper as it contracts will come away from the deepest parts, and so stretch itself fairly smoothly, although some of the texture will still be apparent. By drying under pressure this can be prevented.—*Photography*.

Coloring Photographs

WE have had several inquiries lately about coloring photographs. We will probably give, later in the year, a few notes on miniature painting and on the working up of enlargements in color.

We give here a few examples on the simpler ways of coloring—useful to those who have not made a study of painting or drawing, but who may have a demand—or be able to create one—for tinted pictures.

There are two distinct methods of coloring prints—from the front and from the back—and of the two the former, if done with true artistic taste, is preferable; the latter, however, is much easier and requires absolutely no skill. The materials used may be either water or oil-colors or aniline dyes, though if the latter are used great care must be taken to choose those that are stable.

The materials required are: Brushes. Red sables should be used for water-colors, not camel-hair brushes; and for oils one or two flat hog-hair of medium size, one or two smaller ones, one or two stumpy ditto, and one or two small flat sables. For water and oil-color painting the following pigments are permanent: Chinese white, light red, vermilion, carmine de Garance, madder lake, cadmium yellow, aureolin, cobalt, emerald-green, sepia, burnt sienna, raw sienna, lemon-yellow, ultramarine, terre verte, yellow ochre. For water-color painting these pigments can be obtained in the shape of powder and mixed with the following medium:

Clarified albumen	1 oz.
Ammonium carbonate	20 gr.
Glycerin	20 min.
Ammonia	1 drop
Distilled water	$\frac{1}{4}$ oz.

To clarify the albumen, obtain the whites of two eggs, beat to a froth, and allow to settle for twenty-four hours and filter; or obtain dried albumen from any dealer; of this, dissolve 20 grains in 1 ounce of water made slightly warm, add the glycerin and then the ammonia and carbonate dissolved in the $\frac{1}{4}$ ounce of water. Filter the mixture and keep in a stoppered bottle. Large quantities of this should not be made up as it soon decomposes; a preservative, such as boric acid, may be added to the above in the proportion of about 1 grain to above quantity.

Although water-colors obtained dry are generally used by advanced workers, the beginner should get the "moist" water-colors as being less troublesome to work.

For oil painting the tube oil colors should be obtained, and to thin them down meglip or medium should be used; a very good medium which dries quickly is mastic varnish, made by dissolving gum mastic 1 part in pure oil of turpentine 10 parts.

All those who have tried know how difficult it is to make colors take well to the surface of prints, and it is usual to prepare the surface in some way, and there are two methods: The first is to lick the print all over; the second is to use a solution of ox-gall. Purchase from a chemist the purified ox-gall, which is a thick greenish-yellow paste, and dissolve this in water and spirit. Sixty grains of the purified gall dissolved in 16 ounces of distilled water, and 4 ounces of wood alcohol added, will make a solution that will keep, and which can be applied to any print with a flat camel-hair brush, and after this treatment, when dry, the print will take both oil and water-color readily.

After the surface has been treated the color should be applied, and for the delicate tints, such as those of the flesh, etc., a stipple or cross-hatch should be used, almost as in retouching, and it is only in the deeper shadows that anything like deep broad strokes should be made. The photographic image will, if you allow it, at least with water-colors, always give you shadows and deeper shades, and it is only when the color is laid on too thick that difficulty will be experienced in obtaining the shades.

For enlargements it is advisable to mount on canvas with clarified fish-glue while both are thoroughly damp, allow to dry, and then flow over the surface some size, prepared by dissolving 4 ounces of gelatin in 20 ounces of water by the aid of heat, and set up to drain and dry.

The foregoing methods all require considerable artistic skill, but the following can be done by any one, even by a child of about twelve or fourteen years of age; the only care required is to keep to the outlines of the printed image. It is more applicable to albumen than to gelatin or collodio-chloride prints, because the supports of the latter are too thick. Obtain a fairly deeply printed albumen print, and soak in water until thoroughly limp, remove it, and blot off the superfluous moisture with blotting-paper. Procure a plain oak picture-frame the required size. Give the front of the frame a coating of fish-glue, and press down firmly on to the paper side of the print, lift the print and frame up, smooth the edges of the print on the frame, and use a roller squeegee to take out wrinkles or folds, then rear the whole up to dry; when thoroughly dry it can be prepared for painting.

Procure a good-size varnish-mop, some japaner's gold size and boiled linseed-oil, and mix the last two in equal proportions, and add one-eighth of the volume of castor-oil. Pour some of this mixture into a saucer and dip the varnish-mop into the same, and give the paper a thorough good soaking until the grain is scarcely perceptible and it is almost transparent; leave for twelve hours reared up against a wall in a warm place free from dust to dry. At the end of this time, with some clean dry blotting-paper, blot off any oil which has soaked through the albumen surface. The varnish should now be nearly

dry or so tacky as only just to hold the finger when applied.

Support the frame at an angle of forty-five degrees over a looking-glass laid flat on the table, so that plenty of light is reflected through it; and with the proper brushes begin to paint with the oil-colors, using mastic varnish as a medium. It is unnecessary to use any art; the paint of the desired tint is merely laid on in broad streaks, keeping only within the outlines, and the photographic image gives all the delicate play of lights and shades. It is astonishing how wonderfully effective are prints thus treated.

When the paint is dry on the back of the print a sharp knife run around the inner side of the frame will detach the picture, and it can then be mounted behind a cutout mount and framed if desired.

To color prints with aniline dyes is not a difficult matter. The real difficulty lies in obtaining stable dyes. For those who wish to attempt, the easiest way to set to work is to purchase some packages of the diamond dyes, which can be obtained at almost any store; turn the contents of the package into a 4-ounce bottle, and add 2 drams of glacial acetic acid and fill up with water. The acid not only helps to dissolve most of the dyes, but also acts as a good medium, for if the solution will not take kindly to any print, the addition of glacial acetic acid will immediately make it take. Such solutions should not be used too strong, and it is preferable to apply two washes rather than one deep one. Always allow one wash or color to dry before applying another over it or next to it, and if care is used there will be no running together. A selection of fine sable brushes should be at hand.

Photogravure Plate Making and Printing

COPPER-plate and steel-plate printing has traveled through ages, yet this method of printing remains the same as in the fifteenth century. It is, indeed, the only printing method where machines have been found unavailable for the higher classes of work. In spite of numberless efforts, no mechanical device has yet been found to take the place of the hand in wiping the plate. The idea of the method of printing is simple enough. Lines are incised or cut into a steel or copper plate. The plate is rolled or daubed with ink, which is thus forced into the lines. The surplus ink is wiped off, leaving the surface of the plate clean, while the ink remains in the incised lines. Pressure is applied to the back of the paper laid on the plate, and the paper, being withdrawn, carries the ink with it out of the incised lines. This is intaglio printing.

A photogravure plate is an intaglio plate where the intaglio is produced by photography instead of by hand.

Photogravures are produced by two processes: one is called the building or deposit process; in the other the photogravure plates are produced by etching.

We must bear in mind the behavior of a steel-plate in printing. It is composed of deep, fine, incised lines, out of which the ink cannot be wiped. In the photogravure plate it is different:

there are no lines, only the tones and half-tones in broad masses. An intaglio print is depressed where these tones and half-tones exist. It is plain some method must be adopted to give these spaces a grain or ink-holding capacity, or else when the plate is wiped there would be nothing to prevent the ink being wiped out of these depressions. To obviate this, the printing plate must, as a primary necessity, possess a grain or ink-holding capacity. In the deposit process, bichromated gelatin is exposed to light under a negative, and a picture obtained, not in light or shade, but in relief and depression. To produce the necessary grain, sand or powdered glass or some equivalent gritty substance has been mixed with the gelatin and gives a grain to it. On this gelatin-grained picture, produced by photography, a copper electrotype is deposited or built, such electrotype having all the necessary qualities for intaglio printing. The admirable work of Goupil is done by this method. In the reproduction of works of art it has never been surpassed, though it is fair and proper to add that a large proportion of its merit is due to the amount of exquisite handling and finishing which is put into the plate after the process work has been completed.

The other method of preparing photogravure plates, and by which by far the greater number is made, is by etching. Provision is first made for the necessary grain by dusting the copper plate on which the etching is to be done with powdered asphalt or resin, and heating the plate sufficiently to melt it; these grains of asphalt, of course, protecting the copper during etching which goes on round them. The copper plate, more or less covered with very fine particles of melted asphalt or resin, is then ready for the reception of the gelatin "resist," properly so-called because its function is to resist, in the proper proportions, the action of the acid with which the plate is to be etched. To prepare the "resist" the services of a bichromated gelatin are again called into requisition. A sheet of bichromated gelatin is exposed to light under a positive (not a negative, or the subsequent operations would make our final picture a negative) and attached to the grained copper plate by atmospheric pressure. The parts of the bichromated gelatin which have not been acted on by light remain soluble and are dissolved away with warm water. There remains an insoluble picture of varying degrees of thickness. This resists in varying degrees, according to its thickness, the action of the acid in which the copper plate with its attached "resist" is now placed for the purpose of etching. When the expert has decided that the etching has proceeded to the right point, the action is stopped, the gelatin "resist" removed, and the plate proved. Do not forget that the necessary grain has been produced by the acid not etching where the asphalt has protected the copper, thus forming small fine grains. Any defects may now be removed and handwork added to the plate, but this must be done by a skilful engraver. It is desirable to avoid this as far as possible, in order to preserve the fidelity of the photographic reproduction. It is rarely safe to supplement the work of the artist with that of another hand.

A Word About Steel Facing

After the plate has been proved, and approved, it is ready for printing, but the copper plate would not wear for twenty impressions if there were no means of protecting its surface. This necessary protection is effected by electric deposition on its surface of an exceedingly fine, thin coat of steel. When steeled, the plate should yield thousands of impressions. If the steel wears at all, the coating is easily dissolved off, and a new coating of steel deposited.

The color of ink in which a photogravure is printed is optional, but there is a very beautiful method of printing photogravure plates, in which the plate is inked locally with a variety of colors, in fact, painted, almost as a painter would paint his canvas, with this advantage, that the design—the groundwork—is prepared for him. When he has laid on his colors, his picture is transferred to paper. The design or groundwork remains, again ready to be painted.

It may readily be conceived that such a process of printing is slow indeed, two or three impressions a day, only, being obtainable from a moderate-sized plate. Perhaps one is hardly justified in calling it photo-mechanical printing. It is an art process, and when artistically done the result fully justifies the labor expended.

The papers generally used for printing photogravures are plate paper, Japanese vellum, French Japan, parchment, and India. Enamel and coated papers are not suitable for photogravure printing.

The paper is prepared for printing by being moistened and allowed to stand for several hours under a light pressure, so that each sheet of paper may become evenly dampened.

Photogravure plates cannot be printed satisfactorily on dry paper.

Making Enlargements

To begin with, one must have a good sound lantern, with a condenser that will cover the plate; not necessarily an elaborate one, but one that is strongly made of seasoned wood, does not leak at the corners, and whose illuminant, be it oil, gas, or acetylene, is optically centered. A special enlarging objective is neither necessary nor desirable, because any good quarter-plate lens of not more than 5½ inches will do all that is required. As the lens has no rack and pinion, it is preferable to have a rackwork frame on the lantern itself, in order to facilitate focusing. It is possible, of course, to merely rely on the sliding telescopic tubes generally fitted in the cheaper patterns; but fine adjustment with these alone is almost impossible, so that the slight extra cost of the rackwork on the lantern is well worth having.

My own lantern has merely the base fitted thus, as I use an ordinary quarter-plate lens, which happens to be a good one, though I don't fancy condensers vary so much in quality as they are supposed to do, but they should be fairly free from bubbles.

The illuminant is a knotty problem. Those who have gas laid on of course can do no better than rely upon the incandescent mantle; the

ordinary upright pattern is the most used. It gives an excellent light, but has the unfortunate habit of projecting the pattern of the mantle on the screen, unless a piece of ground-glass is interposed between it and the lens.

It is now possible, I believe, to procure the inverted mantle fitted with cowl and tray for use in any lantern. This is a step in the right direction, for in this type the light is much more concentrated, and, being smaller, there is less loss of light, a thing which is exceedingly difficult to overcome whenever ordinary gas is used.

Acetylene has its advantages in some ways. The light is very intense and of good actinic quality, but it is dangerous unless very well fitted, and then it becomes expensive.

It is quite possible, however, to rig up an acetylene installation by the aid of a bicycle lamp, using the lamp merely as a generator, and connecting a burner from the lantern to it with India-rubber tubing. It is difficult to center the light, however, but this can be overcome by a little experimenting. For small condensers, one burner should be sufficient; but for anything over 5½ inches in diameter, two or perhaps three, would be necessary. The great point to be observed, whatever illuminant is employed, is even lighting of the screen. The circle should be quite bright all over, without any shadows or discoloration; the latter is often caused by faulty condensers. By discoloration I mean bluish patches near the edges where the illumination falls off. Unless this is overcome it is absolutely impossible to get sharp enlargements, however good the negative may be. When the light is optically centered, there should be no difficulty in getting sharp detail, even at the extreme edges of the print. There are several other points that tend to make for this end, one is exact parallelism of the lantern and screen, and another is the angle at which the screen is set. Under normal conditions it should be at right angles to its base. There are times when it becomes necessary to depart from this latter rule, generally when the lines in an architectural negative require to be corrected, then the screen often requires to be tilted backward or forward as the case may be.

Having disposed of the apparatus, the negative itself is the next consideration. It is a great mistake to imagine that every technically good negative is suitable for enlargement.

There is a certain quality that alone will give the finest results, and that quality can approximately be described as thin and clear, with abundant detail, yet without any actual clear glass.

It is often said that there is a certain printing quality for every process, one particular quality which will give the best print.

For instance, a pyro-developed negative, with its slight yellow stain, is admitted to give the best P.O.P. print, or any other print for which daylight is employed, viz., platinum, carbon, etc. But in artificial-light printing I have never found the pyro negative in any way superior to the negative developed with some of the more modern developers. In fact, a number of my best enlargements have been from hydroquinone-developed negatives, most of which were clear

and very thin, yet with ample detail. The only reason why I use pyro habitually nowadays is because if I am uncertain of any of my exposures I find I can obtain more uniform results, owing to the greater control which is possible with a pyro developer.

A dense negative is totally unsuitable for enlarging by artificial light, that is to say, if a pictorial result is expected. It might take half an hour for the light to penetrate the darkest portions, during which time the paper is almost sure to show signs of fog from any stray light which may emanate from the lantern, and there is sure to be a little, especially from the chimney, however well the thing is constructed. It has no effect when the exposure is only of short duration, as it has not time to act.

Bromide paper is nowadays made in so many different varieties that it is often hard to make up one's mind what kind to use. Generally speaking, a paper with a moderately rough surface will give the most pleasing result. The rapid or extra rapid is specially adapted for artificial light work, and yields the softest prints. It should always be borne in mind that the enlargement of a negative tends to increase the contrast of the picture, so that harshness has to be guarded against.

One has also a considerable amount of control over the image when enlarging, a thing some workers are apt to overlook. For instance, a landscape negative containing light clouds, which are often extremely hard to bring out by contact printing, are quite easily printed through the lantern. All that need be done is carefully to shade the lower portion of the picture when its exposure is complete, allowing the highlights and clouds to have a longer exposure. The shading must be done evenly, so as to prevent any difference between the two exposures showing. A piece of cardboard kept constantly on the move, and large enough to continually cover the finished portion while the clouds are being printed, is the most simple way of doing this.

Now as to the exposure itself, which, after all, is the crux of the whole matter, and which is a difficult subject to write about—no rule which would be infallible can be laid down. Experience is the only reliable guide after all, and it is very soon gained with a little practice.

We have two factors which are more or less consistent at all events, namely, the bromide paper and the illuminant. The negative and the size of enlargement are variable factors. With regard, however, to the bromide paper, it must be remembered that its speed only remains constant so long as one adheres to the same speed of paper—even different varieties of paper by the same maker vary considerably in rapidity.

The size of the enlargement affects the exposure to a very great extent; for example, if a quarter-plate negative enlarged to a whole-plate required eighteen seconds, it would require half as much again if enlarged to 8 by 10, and double if enlarged to 10 by 12.

It is always advisable to make a note of the exposure and degree of enlargement, together with the brand of paper used for each negative, and to keep it as a reference for future use.

In the development of an enlargement several important things have to be observed: for example, the kind of developer to use, the amount required, the method of using it.

Amidol, metol, rodinal, ortol, hydroquinone, are all suitable in their way; but the simplest is amidol, and the most useful for all-round work. There are so many good formulas of this developer published, that it would be superfluous for me to furnish one here. Every maker nowadays includes one in his list. Nevertheless, whatever particular one is adopted, it should always be compounded at home, for amidol is useless when stale, and a fifty cent bottle of the chemical in dry powdered form will last for months. There is nothing complicated about its dispensation, and the only other ingredients necessary are a small quantity of sulphite of soda and a little potassium bromide.

It will keep in solution and remain good for four days, after which it turns pink, and loses its power as a developer.

Rodinal is very useful as a single-solution developer in the concentrated form, to which it is only necessary to add water to form a working solution.

It does not, however, produce such a rich tone as amidol, but for some subjects of a delicate nature it is admirably suited.

Whatever developer is selected, a sufficient quantity of it should be used, in order to cover the paper in the dish; otherwise it will not flow evenly over the surface, and patches caused by uneven development will result.

Six ounces of solution should be used for a 10 by 12 enlargement.

The paper, when taken from the easel or screen, should be laid carefully in the dish, and then flooded with water, or even slid into the water which has been previously placed there.

Air bubbles are often a source of annoyance, and therefore large sizes of paper should be allowed a full minute to soak before pouring on the developer.

As so many workers find it exceedingly difficult to judge when development is complete by red light, pains should be taken to see that there is plenty of it. In fact, it is an absolute necessity to have a good light to work by when developing enlargements.

There is no risk of fogging the paper if good quality ruby glass is used. The image should be developed fully, and then held up to the light, and its density judged by looking through the paper. The fixing bath has a slight tendency to darken the image, thereby increasing the contrast, so that development should not be carried too far.—G. E. C. MORRIS.

Correct Exposure

It would be interesting to learn what proportion of plates which are exposed actually receive correct exposures; that is to say, the exposure which will give the exact effect which the photographer has aimed at. Probably the smallness of the percentage would astonish most people, but as no exact quantities are involved, the point must ever remain wrapped in mystery. It is an undoubted fact that photographers trust too

much to instinct in this matter, and that a little intelligent study would in many cases result in a distinct improvement in the average quality of the work. The shyness with which most professionals view tank development is in itself a proof that they distrust their exposures and hope to be able to correct their errors in the developing dish. Unfortunately, in the rush of modern business, there is little time for experiment, but even the once common precaution of testing a plate from a new batch along with one of the batch which is running low is rarely taken; the day's work is gone on with, and when the negatives are looked over the remark is made, "These new plates are a bit slow" (or fast, as the case may be). It is a well-known fact that plate-speeds as marked on the boxes are no more than a general guide, especially when the extremely high numbers now demanded by many photographers are given. Some makers' 350 are about the same speed as others' 250, while with the same brand we have found an enormous difference between a batch marked 250 and one marked 275. Here, then, we have one factor of uncertainty over which the photographer has no control except by making a comparative test such as we have already mentioned.

Another factor is the variation in the strength, or rather quality, of light, which most operators estimate by the eye only. It is not at all a safe practice, for a variation of 20 or 30 per cent. in actinic value may easily exist without being noticed. On doubtful days a test with an exposure meter, even if only of the shilling "indoor" variety, would enable a much more correct exposure to be given. Many skilled operators regard the use of exposure meters as amateurish, but this is a serious mistake, for their uses are as clearly defined as those of the thermometer, or even the graduated measure. It is the amateur carpenter and the botcher who scorn the rule and gauge, not the skilled workman, who, with a quarter of a century's training, might well be expected to "see straight."

Especially do we commend the use of the exposure meter to the outdoor worker whose exposures are most frequently made indoors. How often are under- or over-exposed plates patched up and made the best of, when the meter would have saved all the trouble. If an operator is engaged in interior work day by day he will, of course, rarely make a serious mistake, but the all-round photographer, who gets an interior perhaps once a week, stands especially in need of a little assistance in judging the illumination, and all the more because a record of exposures is rarely kept by professionals.

Diaphragm apertures afford another pitfall for the unwary. With modern lenses marked with the F. values there is little excuse for error, although we regret to say that even when using these many photographers have to resort to guess-work, but there are many thousands of good lenses, both portrait and rectilinear, which have their stops marked either with arbitrary numbers or on the Dallmeyer decimal system, which convey no idea of their relative values to the majority of their users. Even in the case of two standard systems, the F. value and the U. S., we have known photographers to give

the same exposures with each, not knowing that only one aperture— $f/16$ —is identical, the others differing in a very great degree.

The bearing of correct exposure upon any particular scheme of lighting the sitter is a very important one, and, unfortunately, is rarely recognized at its true value. An operator will light a head so as to be quite satisfactory to the eye, but upon development the negative is found to be hard and chalky; and for the next attempt the lighting is altered, with the result that a better negative is secured, but the original effect is lost. If one has a liking for bold effects in portraiture, he will do well to try varying his exposure before altering a lighting which was pleasing to him. Much can be done in development, especially with over-exposed plates, but there is only one exposure which will give the exact gradation which is seen in the studio, and that is the correct one. There would be fewer cases of false lighting if there were fuller exposures and less use of the reflector.—*British Journal of Photography*.

Diffused Light and Direct Light, and Some Facts in Practice

THE photographer, whether professional or amateur, requires to make the use of light his chief business or occupation. He uses light not only in conjunction with a lens in making negatives in the camera nor exclusively in the printing from negatives on to sensitive paper. He is concerned with the practical management of light in many other ways than these, and, therefore, it is to his advantage that he should have a practical acquaintance with some of the properties of light as they apply to various photographic operations and apparatus. This, it need hardly be said, is a large field of knowledge, and, moreover, one which, unfortunately, is very little considered in the text-books on light which are available. In these notes my object is only to explore a very small portion of this field—in other words, to say something about the difference as regards practical usefulness in photographic work between light which is "direct" and light which is "diffused." Although these terms are in common use I believe that the essential facts which they represent are not recognized by many practical photographic workers. Some discussion, therefore, of the behavior of light in what we may term these two different forms may, perhaps, be of real usefulness in helping photographers to make the best use of apparatus or to adopt methods which are best adapted to a particular end.

As everybody knows, light travels in straight lines. The difference between light which is direct and that which is diffused does not lie in any departure from this law. Nor is it essentially a matter of strength or intensity of illumination. Obviously the diffused light from a clouded sky upon a surface may be more intense than that of direct rays from a lamp. We associate direct light with the casting of a sharp shadow, while in diffused illumination no shadow of an object is to be discerned. That is the essential difference between direct and diffused light, and it

arises from the fact that rays of light which have been diffused by passing through some medium or by being reflected from some surface progress in every conceivable direction (along straight-line paths) from every point of the transmitting or reflecting surface. In other words, light out of doors which reaches us through clouds or by reflection of direct rays of sunshine from the surfaces of clouds comes as a series of infinitely numerous rays radiating in all directions from each point in the cloud. That is a very different condition from the passage of light direct from the sun which, at its immense distance, is a very small source of light. In the one case we have large areas comparatively close to us sending rays in all directions; in the other, we have rays proceeding without obstruction from a source ninety-five millions of miles away. This diffusion takes place whenever light is reflected from a surface which is matt or dull as compared with one which is polished, or whenever light passes through a medium such as ground glass or fabric which is not perfectly transparent.

In almost any street on a sunny day you can see a very good illustration of the characteristic action of a light-diffusing surface in comparison with one which, by its polished nature, reflects light sharply. The windows of many shops have affixed to them lettering of a more or less matt material. With the window in full sunshine a large volume of light is reflected upon the pavement by the glass, but in the case of the lettering the light is scattered in all directions, with the result that the pavement receives a lesser volume of reflected rays and the letters thus appear upon it darker than the surrounding surface.

One has only got to think for a moment, and it will be clear that it is through the agency of this diffusion or scatter of light in all directions from a matt surface that objects of any kind are visible to us. Rays of light are reflected from them in such an infinite multitude of directions that some inevitably reach our eyes. On the contrary, if an object is of a highly reflecting surface, *i. e.*, one which does not diffuse light in this way, it is visible to us only when we stand in just that position where the rays reflecting from it meet our eyes. You get a good instance of this very often in the country when suddenly a small window in a church tower will appear as a brilliant patch of light as the result of our stepping into the path of the rays reflected from it. The difference of a few feet either way from this position will cause it to sink again into invisibility.

From all this we understand that without any departure from the law of a straight path, the effect of reflection from a diffused surface is to spread light in all directions—up, down, and on each side. Naturally, the intensity of the light reflected in any given direction is much less than that which would be produced by reflection from a polished surface. The latter reflects, roughly, the whole of the light falling upon it in one direction, while a matt surface spreads the same volume of the original light over a much wider area.

To come now to some of the applications of this common phenomenon in photographic work. One of the most homely is, perhaps, the

safe-light in a dark-room lamp. Everybody, perhaps, recognizes, without precisely knowing why, that a dark-room obtains more general and comfortable illumination if the orange or ruby material in the dark-room lamp is not transparent like glass, but is of such a degree of semi-transparency that the shape of the light—electric filament lamp or incandescent gas mantle—cannot be seen through the safe-light. Clearly, if the safe-light is one of ruby or orange fabric or of dyed gelatin films with one or more thicknesses of tissue paper between them, the safe-light becomes a surface which scatters light over a much wider area than is the case if the rays from the source of light pass through a glass screen with no alteration other than that of removal of part of the colored constituents of white light. Another reason, too, of the greater comfort of a semi-transparent safe-light comes into play. It is that the eye is in some measure relieved from the glare of the concentrated source of light, with the result that its sensitiveness is greater, and it is better able to see distinctly in the weak orange or ruby illumination.

The same thing happens when the light in the dark-room is obtained altogether by reflection from a solid surface, although, of course, that is not a good kind of illumination for viewing negatives by looking through them. But for the development of prints and for generally being able to find anything in a dark-room this general diffusion of light is good and very efficiently obtained by fixing up any kind of box a foot or two below the ceiling, arranging the safe-light, either glass or fabric, on the upper horizontal surface, so that the whole of the orange light passes directly upward, and is reflected and at the same time largely diffused throughout the room from the white ceiling. As an adjunct to the ordinary lamp over the working bench, illumination of this kind is a great comfort in the dark-room, and it is surprising what a considerable degree of light can be employed in this way without any ill-effects in the way of fog upon papers or even plates.

Again, we can see the operation of this same spreading of light in the photography of interiors or in taking portraits or photographs of any objects in ordinary rooms. When the light outside is bright sunshine, or even when it proceeds from a comparatively clouded sky, the part of the room which chiefly receives the illumination is that immediately facing the window. Parts to the right or left are cast in shadow, which almost invariably proves very much deeper in the photograph than it appears to the eye. Experienced photographers of interior subjects know the advantage which results in the way of more equal distribution of the light by closing the space of the window with some diffusing medium, such as thin muslin. The use of such material amounts to the bringing just within the room of a new, though weaker, source of illumination, the rays from which spread on each side to a markedly greater extent than they do from the unobstructed window. This simple device is often the means of making a marked improvement in general interior views, particularly in cases where a window faces the camera, the muslin remaining in position for the greater part

of the exposure, and being removed for the lens to be uncapped for a second or two at its termination. And the same improvement applied to indoor portraiture or to the photography of things like furniture, in regard to which a small part of the window may be left uncovered, in order to give such a (small) volume of direct light as may be necessary for the introduction of touches of strong lighting.

In the illumination of negatives for enlarging without a condenser we rely upon diffusion by both reflection and transmission. The illuminating-box sold for use with the Kodak Brownie enlarger is a good specimen of the application of this principle. The light (of a metal-filament lamp) is placed in a closed box of comparatively small size. Rays from it are reflected in a state of diffusion from the sides of the box and from its curved back, and are still further diffused by passing through the semi-transparent screen placed immediately behind the negative. Those who make illuminating-boxes for enlarging should not forget the very great diffusing effect which they can obtain by reflection from the sides of the lamp container. While materials like sheet opal produce a very high degree of diffusion, there is no reason to forego the further effect which reflection affords and in so doing utilizes rays of light which otherwise would be lost.

This same advice applies also equally in illuminating a negative for a contact printing box. It is better to have the walls of the box lined with good matt white paper than with mirrors, as I have sometimes seen, and while I am upon this point of printing boxes I may emphasize one item which has nothing to do with the subject proper of these notes, but which, apparently, is often ignored by those fitting their own electric lamps. It is that the lamp should be placed longways in the box, that is to say, with the length of the filaments parallel with the negative. You thus get a greatly increased illuminating area as compared with that obtained by fixing the lamps, as is often done, with their tips uppermost. That such a piece of advice is not altogether uncalled for should be evident from the fact that some few years ago a special pattern of metal-filament lamp was introduced in which the filaments ran as a kind of grid horizontally across the bulb. This was for no other purpose than for obtaining the larger illuminating area which is just as easily secured by placing the lamp sideways.

These instances should be sufficient to emphasize the value of securing diffusion of light both by reflection and transmission, but in conclusion, the conditions of a portrait studio need be mentioned only in order to remind my readers of the large part played by diffused light reflected from studio walls in the lighting of the sitter. In a studio which is too big this effect is lost, and the only remedy in such cases is to erect, as it were, a studio within a studio. In others of more appropriate size it is lost from the dark color of the walls. Instead of the light being reflected in very large measure, it is absorbed by the dark wall covering, and I could point to instances where exposures in a studio have been cut down to a surprising extent by getting

rid of dark brown or deep green wall-coverings and replacing them by light gray or cream.—MONTAGUE H. POPE, in *British Journal of Photography*.

Washing Post-cards

To the average photographic worker the washing of prints always presents a problem which is not easy of solution, and post-cards in particular, on account of their extra weight, have a tendency to sink to the bottom of the tank, and lie there in a heaped up mass. In this condition it is impossible to get rid of the hypo from the film, and consequently post-cards done in this fashion cannot be said to be washed at all, and in a few months' time spots and stains are nearly certain to make their appearance on the cards. A very simple way of making sure that the cards will be thoroughly washed is to use the rack in which the plates are placed for washing. A quarter-plate rack is just right for post-cards, as when these are placed in position the cards will be slightly bent, and thus kept firmly in the grooves. Some cards have a tendency to float to the top of the water, and this can be prevented by fastening a piece of string over the top of the cards, and fixing the ends to the edges of the rack. This will be found one of the most convenient ways of washing cards to the worker who only does a few at a time.—*Amateur Photographer*.

Sodium Sulphite Crystals

SODIUM sulphite crystals can be dissolved very easily if warm—not hot—water is used. The best way is to put the crystals in a muslin bag and suspend it in the water. The sulphite solution falls down as the crystals dissolve, and the remainder is constantly in contact with comparatively fresh water.—*The Professional Photographer*.

Diffusing the Image in Fixed-focus Enlargers

It sometimes happens when enlarging with one of the popular fixed-focus daylight enlargers or printing boxes the all-over sharp result fails to quite satisfy our pictorial sense, and we wish for some means of diffusing the image. One plan is to lay a piece of the bolting silk sold for this purpose across the bromide paper; but it often happens that this is not obtainable locally, and some kind of substitute must be devised. The present writer has made use of a piece of butter muslin fixed to a light cardboard frame made to fit into the enlarger about an inch above the bromide paper. Such a frame is easily fitted up, the coarse butter muslin fixed with "seccotine," and when required for use the whole may be fastened with four drawing-pins underneath the frame to the inside of the enlarger or printing box. It will be found that a slight diffusion will be produced over the enlargement that will take away any over-sharp qualities that the negative may possess, and thus enhance the pictorial result in the manner desired.—*Amateur Photographer*.

An Economic Note

At the present time, when everyone is endeavoring to practise economy, not many workers realize the saving that they might effect upon their printing paper by using a slightly smaller size, such as $3\frac{1}{2} \times 2\frac{1}{2}$ for quarter-plate, quarter-plate for 5×4 , 5×4 or $6 \times 4\frac{1}{2}$ for half-plate, and 7×5 for whole-plate negatives. Reflection will show that in nearly every case the prints have to be trimmed down to something near this size, or even smaller, and as these trimmings represent so much waste, there is every reason for the course mentioned above. Though the saving may not be very great, it is the parts that make the greater, and here is one way of economizing without, as is so often the case, endangering the ultimate success of our work, which is far from real economy.—*Amateur Photographer*.

Nickel-plated Fittings

NICKEL-PLATED fittings can easily be cleaned with alcohol to which 2 per cent. of sulphuric acid has been added. Apply this mixture liberally and, after a few seconds, wash off with clean water. Then rub over with a swab dipped in fresh alcohol, containing no acid, and polish with a dry cloth. This method will give brilliance to the dullest piece of nickel-plate without damaging it in any way.—*The Professional Photographer*.

Improving Bromide Enlargements with Gold

IN most cases, particularly with small prints, it costs more to improve a print than to make a new one. Special intensifiers and reducers are recommended, but as many of the solutions require extra chemicals, and have to be specially made up, it is more economical to make fresh prints unless the sizes are large. When, however, enlargements are being dealt with, the question of improvement is worth consideration. A piece of bromide paper of standard British make, measuring 12×10 inches, can be improved at less expense than would be involved in making another print, and as the process I have recently been experimenting with is very inexpensive, it may be found useful.

One of our greatest authorities says that over-exposures to the extent of 100 per cent., if properly developed, will give results similar to those from correct exposures. Unless, therefore, the worker is very much at sea in the matter of calculating exposures, he is not likely to get many very bad examples of over- or under-exposure. Over-exposures are more easily reduced than under-exposures are intensified, but I do not propose here to deal with either method. The more common defect in enlargements, when a pure black is aimed at, is bad color.

A disappointment many workers meet with is that of finding their finished pictures greenish or brownish black, instead of pure black without a trace of any other color. Amidol tends to give a black with a suspicion of blue, though very slight; the tone of the image, however, is pleasing and amidol is very largely used for enlargements. For a jet black the metol-hydroquinone developer is perhaps better; but no matter which

of the developers be used, errors in the direction of over-exposure, variations in the amount of potassium bromide, and staleness of the developing solution, will produce an image of a greenish or brownish tint, the former being the more common and certainly the more unsightly. Any attempt to tone such a picture to a brown will end in failure; a yellowish or washed-out brown would result, and the best thing to do is to use a gold bath.

Most if not all photographers keep a solution of gold chloride in stock, so that the process deserves to be more widely used than it is at present. Any of the gold baths used for toning gelatino-chloride or albumin papers may be used, but after many trials with various things I have decided in favor of the somewhat old-fashioned acetate of soda. The exact strength of the bath will depend upon the size of the print to be treated and the way in which it is to be used. The following is a normal solution:

Water	5 oz.
Acetate of soda	20 gr.
Gold chloride	1 gr.

As ammonium sulphocyanide is more common in dark-rooms than the acetate, many will prefer to use it. A suitable solution may be made according to the above formula by substituting 20 grains of sulphocyanide for the acetate of soda. Sulphocyanide in my hands works less evenly than the acetate, and with some bromide papers makes the gelatin film dangerously soft if the solution is worked for very long. One may of course harden the print although hardening slows the action of the toner, but in some cases this may prove an advantage.

Large bromide prints are not easy to tone by immersion, in the way that P.O.P.-pictures are usually toned, because the edges tone so quickly that they become over-toned before the center of the picture is reached, especially if the solution is strong. If the print is to be immersed the quantity of water should be doubled or trebled to slow the action and make the deposit of gold more uniform, but at its best the immersion method is not a very good one. The better plan is to lay the fixed and washed print face upward on a piece of glass or the underside of a porcelain dish. If the print has been allowed to dry it may be rewetted and placed on the glass or other support. The toning solution is then swabbed over the print with a piece of cotton wool, so that the center of the large picture may receive as much attention as the edges. Speed of working depends upon the strength of the bath, but if this is normal the image will soon become richer and of good black, while prolonged action will give a bluish tint. The picture will also be slightly intensified. The print is finally washed and dried as usual, no further fixing being necessary.

The process is simple, and those workers who have not tried it, will be surprised at the added richness of the blacks when the treatment is applied to one or more of their badly colored bromide or gaslight prints.

Crimson tones may be obtained by treating a sulphided print in a gold bath, but this cannot be said always to improve a print. The orthodox

sulphide-tone is pleasing, while a picture of more or less vivid crimson is not invariably attractive. The print to be treated is first toned to a sepia by any of the sulphiding processes, washed, and then toned in the usual way in the following gold bath:

Water	3 to 4 oz.
Ammonium sulphocyanide	10 gr.
Gold chloride	1 gr.
Hydrochloric acid	10 min.
Common salt	15 gr.

Toning is rather slow but may be hastened by using more gold. The average time for toning with this bath is half an hour.

Eliminating Hypo

DECOMPOSITION in sensitized goods is often attributed to insufficient washing, when, as a matter of fact, the real cause is more often insufficient fixing. Proof of this statement is seen in the result of a recent experiment in the Kodak laboratory on the elimination of hypo from the film of negatives.

1. The elimination of hypo from a negative depends very largely upon the agitation given to the water, very rapid and complete agitation causing twice as much elimination as is secured when the material is merely left in the water to soak.

2. The rate of washing out the hypo is practically independent of the temperature of the water, measurements made at 65°, 70° and 80° F., all showing the same rate of loss of hypo. This result, although it appears strange and is contrary to usual belief confirms some experiments made many years ago.

3. The elimination of hypo is very rapid in all circumstances, the amount of hypo in the film being reduced one-half every two minutes if plates are left stationary and every one minute if agitation is ensured. Consequently with complete agitation the film may be considered to be free of hypo in ten minutes, and if the agitation is less complete, twenty minutes is sufficient.—*Photo Digest.*

The Use of Supplementary Lenses

A CORRESPONDENT recently suggested that it would be useful to have a table showing at a glance the effect of adding supplementary spectacle lenses on to ordinary photographic objectives. No doubt such a table would be of use, but, unfortunately, it is not possible to make a very comprehensive one, since the possessor of a photographic lens seldom has the particulars necessary to enable him to make full use of the table. To get exact results we want to know the focal length of our lens and the amount of the optical separation, and the former is seldom known exactly, while the latter varies very materially with lenses of different types, and is a factor that cannot well be ignored. If we add a supplementary negative lens of about 16 inches focal length to a doublet of about 8 inches focal length, neglect of the separation gives an answer

that is 2 inches too much, about 16 instead of about 14 inches, and this is a material error. It is therefore impossible for any table to be absolutely right. Our correspondent submitted a rough table showing the effect of using a very varied series of supplementary lenses, from 1 up to 40 inches, which table not only ignored separation, but apparently assumed that very short-focus supplementaries could be used with impunity, and also that spectacle lenses of focal lengths in inches could be obtained readily. We fear, however, that no photographic lens would preserve much of its defining power if compelled to work in conjunction with a 1-inch spectacle lens, while there would be great difficulty in getting such a lens at all.

For economic reasons it is inadvisable to ask for lenses that are not of stock focal lengths, and spectacle lenses are stocked in powers measured in diopters, not in focal lengths. Thus the request for a 40-inch lens may lead to the supply of one of 39 $\frac{1}{2}$ inches, which is the nearest regular power, or, if the order is taken too literally, to the special manufacture of a 40-inch lens which may cost a good deal more. A lens of a power of one diopter has a focal length of 1 meter, and the power varies inversely with the focal length, so that a lens of 3 diopters has a focal length of $\frac{1}{3}$ a meter. Lenses are usually stocked in powers varying by $\frac{1}{4}$ of a diopter, and the following table gives a series which covers all that are at all likely to be required for use as supplementary lenses. The focal lengths in inches are approximate only.

0.50 D = 78 $\frac{1}{2}$	2.00 D = 19 $\frac{3}{4}$
0.75 D = 52 $\frac{1}{2}$	2.25 D = 17 $\frac{1}{2}$
1.00 D = 39 $\frac{1}{2}$	2.50 D = 15 $\frac{3}{4}$
1.25 D = 31 $\frac{1}{2}$	2.75 D = 14 $\frac{3}{4}$
1.50 D = 26 $\frac{1}{2}$	3.00 D = 13 $\frac{1}{4}$
1.75 D = 22 $\frac{1}{2}$	3.50 D = 11 $\frac{1}{4}$

The table applies to either positive or negative lenses, a plus sign being prefixed for the former and a minus sign for the latter when ordering. Positive lenses are required to shorten the focal length and negative ones to lengthen it. Double convex or double concave lenses are most easily obtained, plano or meniscus lenses generally having to be specially ordered. The form does not matter very much so long as only low-power lenses are used, and only low powers are suitable for use as supplementary lenses.

To find the supplementary lens required to alter focal length, first find the separation, or its nearest equivalent, which may be taken as about half the length of the doublet, if that is of the symmetrical type. Deduct this dimension from the focal length of the doublet, and multiply the result by the focal length required. Then divide the result by the amount by which the focal length is to be shortened or increased. For example, suppose we want to reduce an 8-inch lens to a 6-inch one—that is, reduce the focal length by 2 inches. We may take half the length of the doublet as being 1 inch, and deducting this from 8 and multiplying by 6 we get 42. Dividing this by 2, we find that a lens of 21 inches is required. This must be a positive lens. The nearest to this is a lens of plus 2 diopters

power, or 19 $\frac{3}{4}$ inches. To increase the focal length from 8 to 10 inches, or by 2 inches, we should proceed similarly. Multiply 8 minus 1 by 10 and divide by 2, the result being 35, which is nearest to 31 $\frac{1}{2}$ on our table, that is to a lens of minus 1 and $\frac{1}{10}$ diopters. A negative lens is always required to increase focal length and a positive one to diminish it.

It will be noticed that in neither of these cases is a lens of the exact power required available. In the second case we have to use a 31 $\frac{1}{2}$ -inch lens instead of one of 35 inches. To find out what effect this variation makes we can calculate the focal length of the combination of doublet and supplementary lens as follows:

Multiply the two focal lengths together and divide the result by the sum of the two focal lengths minus the separation; remembering that if the supplementary lens is a negative one its focal length is a negative quantity. Thus in the first of the examples given above we multiply 8 by 19 $\frac{3}{4}$ and divide by 8 plus 19 $\frac{3}{4}$ minus 1, the result being 5 $\frac{1}{10}$ instead of 6 inches, which was the result aimed at. In the second example we multiply 8 by minus 31 $\frac{1}{2}$ and divide by 8 minus 31 $\frac{1}{2}$ minus 1, the result being 10 $\frac{1}{10}$ instead of 10 inches. Trial will show that a lens of minus 1 diopter would have given 9 $\frac{1}{2}$ inches as the result, so that we have the choice of two, both giving nearly the length required. Speaking generally we may say that lenses of lower power than 1 diopter are not necessary, while those above 2 $\frac{1}{2}$ diopters are not advisable. Variations of less than $\frac{1}{2}$ diopter are not required as they make little difference. Powers of 1, 1 $\frac{1}{2}$, 2 and 2 $\frac{1}{2}$ diopters are most useful, and their effect on lenses of 3, 4, 5, 6, 7 and 8 inches focal length can be very approximately gathered from the following table, in which we have allowed for separations varying from $\frac{1}{2}$ to 1 inch, according to the focal length of the original lens.

Original Focal Lengths

Supplementary lenses.	3	4	5	6	7	8
+2.5 D	2 $\frac{3}{8}$	3 $\frac{1}{4}$	3 $\frac{3}{8}$	4 $\frac{1}{2}$	5	5 $\frac{1}{2}$
+2.0 D	—	3 $\frac{3}{8}$	4 $\frac{1}{4}$	4 $\frac{3}{4}$	5 $\frac{1}{4}$	6
+1.5 D	—	3 $\frac{1}{2}$	4 $\frac{1}{2}$	5	5 $\frac{3}{4}$	6 $\frac{1}{2}$
+1.0 D	2 $\frac{1}{4}$	3 $\frac{3}{4}$	4 $\frac{1}{2}$	5 $\frac{1}{4}$	6	7
+1.0 D	3 $\frac{1}{4}$	4 $\frac{3}{8}$	5 $\frac{1}{2}$	7	8 $\frac{1}{4}$	9 $\frac{1}{4}$
—1.5 D	—	4 $\frac{5}{8}$	6	7 $\frac{1}{2}$	9	11
—2.0 D	—	4 $\frac{3}{4}$	6 $\frac{1}{4}$	8 $\frac{1}{4}$	10	12 $\frac{1}{2}$
—2.5 D	3 $\frac{1}{2}$	5 $\frac{1}{4}$	6 $\frac{3}{4}$	9	11 $\frac{1}{2}$	14 $\frac{1}{2}$

Blanks are left in the 3-inch lens column because the different effects of 1 $\frac{1}{2}$ and 2 diopter supplementary lenses are negligible. The former may be considered to have the same effect as 1 diopter and the latter the same as that of 2 $\frac{1}{2}$ diopters. The most useful variations are given with lenses of 5-inch focal length and upwards.

As before said, 2 $\frac{1}{2}$ diopters is the strongest lens of the simple spectacle type that we can recommend. If greater power is required it is best to get a corrected supplementary lens specially suited to the original objective, and the makers of this original are best capable of advising in regard to the particular type of lens suit-

able. In the case of anastigmats it is always advisable to consult the makers, as some forms of such objectives can very readily be upset as regards their corrections.—*British Journal of Photography*.

Retouching

WHEN the millennium arrives it is probable that a photographer will please his patrons without resorting to retouching; but, except a few fortunate mortals, all photographers are obliged at the present time to do more or less after-work on their negatives. The reasons for this are twofold: first, to correct defects in the plate and manipulation—though this might more properly be classed as “spotting;” and, secondly, to tone down those details of feature, etc., which the camera is apt to exaggerate.

There is no royal road to retouching, and there are no trade secrets in it. Care, close attention, and lots of practice are very necessary, and the retoucher should have all the general art knowledge that he can obtain; and, most of all, the man who would really excel must have a fine sense of restraint and know when to stay his hand. The essentials for retouching are few. The retouching desk is a sloping board to stand on a table, with a small hole cut in it. The negative is placed over this hole, resting on a little ledge which is fastened to the board, and held in place by a metal clip-spring or other simple means. The hole in the board allows light to be thrown through the negative, and so secures a good illumination. Either daylight or lamp may be used, and a mirror reflector will direct the light to the right spot. A pencil of the best quality should be used—either Hardtmuth's or Faber's will do very well—and it should be sharpened to a very long, fine point. After sharpening with a knife, finish the point by rubbing on sandpaper. The pencil-point will not “bite” on the surface, and so a retouching medium is used to give the negative film a slight roughness. A retouching medium is thoroughly dissolved together and

Gum dammar	6 gr.
Rectified turpentine	1 oz.

filtered through absorbent cotton. I have not tried it, as I use a somewhat similar varnish which I find quite satisfactory. Mix powdered resin in turpentine to about the thickness of cream. If it is found too thin on the negative, stand the bottle in the window with the cork out, and the turpentine will soon evaporate until it is of the desired thickness. If too thick, of course it may be thinned with more turpentine. To coat the negative, take a wad of silk rag, or of very soft, clean chamois leather which has been repeatedly washed, and moisten it with the varnish and rub it gently on the film. Rub it with a circular motion. If cotton wadding is used the “hairs” stick to the varnish and cause trouble, and a linen or cotton cloth may scratch the film.

Before entering on retouching it is well to be sure of one's eyesight. It is very trying work, and

requires not only a steady, strong eye, but a delicate hand as well. The stroke given with the pencil is so short that it is generally made with a slight vibratory motion of the finger and thumb, the wrist not being called into play. The elbow should rest on the edge of the table to give support, and for the most delicate work a mahl-stick should be used to support the wrist, being held, of course, in the left hand. Sit squarely up to the work—don't bend over it too closely; that is good neither for the eyes nor the health.

The especial touch to be used in retouching is largely a matter of preference, or, perhaps, of habit. Many touches are recommended. Some people suggest a mere succession of dots with the pencil; others suggest curved lines, or cross-hatching, or other special preference. More important is to know exactly where you want your touches and what result you are aiming at. The touch will then come of itself, to a large extent. Before going into details of a face, I may just caution the retoucher to be very careful to study the exact shape of his lights. Take, as an example, the nose. We often see a photograph with a straight, brilliant strip of light running from the root to the tip, where it expands into a larger spot. Now, the nose is really composed of three sections. First, there is the bone for about one-third of its length. This is continued as gristle, and at the point of connection the band of light is generally bent; and, lastly, there is the fleshy end of the nose, where the light again changes. The modelling, too, of the temple, of the cheekbone—in fact, of every detail—depends on proper appreciation of the shapes and values of the different areas of light. A good modelling is very essential. Retouching gives an added roundness to the face or figure. Before commencing to retouch, obtain a proof-print from your negative; compare it with finished prints from retouched negatives, and mark where it fails. There will appear many slight defects. The wrinkles or curves at the corners of the mouth generally require toning down, and if, as is sometimes the case, they have a downward trend, they should be straightened or turned upward. A mouth curved upward at the corners gives a pleasant expression. A downward curve gives the reverse. The lips, being red, naturally tend to take darker than they should do. Notice these carefully in the proof. There will probably be three depths of shade in them, and these relative depths must be preserved. A little accentuation of the shape of the lips can be done. In theatrical work the lips and teeth sometimes are subject to considerable modelling. The eyes share with the mouth in giving expression to the face, and in the eye great care is required. It is generally a great mistake to lighten the white of the eye, run a decided line around the iris, and then darken the pupil, though this is often done. This darkening of the pupil is done with a needle, making tiny holes in the film to let light through. And here we may say that darkening or “cutting away” is very useful in photography. With a really sharp knife, and care, high-lights can be pared down and a good deal of control exercised.

If there are many conflicting reflections in the eyes, work out most of them. The eyelashes are often scratched in, and done very badly. We do not see the separate lashes as we look at a person; they are either in even shades or in small masses. In working round the big masses—the forehead and cheeks—don't get too much light. Gradually soften down in working away from the highest light, and do not encroach to much on the shadows at the sides of the face. They give modelling and relief to the portrait. In cases of ladies in low-cut dresses—especially if the subjects are very thin—it will be necessary to tone down certain muscles, as the one leading from the ear to the breast bone and the hollow at its insertion into the bone. In this case the knife may darken and the pencil lighten to overcome undue contrast.

There is a custom now which is being carried to undue extremes to accentuate a shadow between the breasts. This should rather be suppressed, giving the appearance of bringing the chest forward. The touching of hair requires some little knowledge. Hair is frequently out of focus, and requires sharpening. To lighten hair, the light should be worked in patches. Light is not reflected from hair in the direction in which the hair lies, but generally forms a band or patch across it. The shape of this band varies, but it is generally wavy or zigzag rather than a straight line. It is a mistake to run lines in the direction of the hair; instead of merely lightening it, this gives the impression of grayness. Remember not to over-touch the hair. The spots of light should be neither too large nor too many, and the dark parts of the hair will be for the greater portion.

The dress often calls for retouching. In getting a correctly-exposed plate of, say, a lady's head and shoulders, the dress may be over- or under-exposed, according to its color. Observation and practice will suggest the right touch; a dress of soft clinging texture will call for curves very different from the stately lines of a silk wedding dress; and the lighting on velvet is characteristic of the material, and differs from the lighting on a cheaper plush. It is very seldom that velvet reflections are pure white light, and care should be exercised to avoid overdoing them. In laces, etc., do not pick out every thread of the pattern; indicate it as delicately as possible. This applies to all parts of the dress, where practicable. Many ladies wish for a record of their dresses, and, of course, it is essential to render them faithfully; but the face is, after all, the center of attraction.

Random Notes

To find the focus of a magnifier required in any case, the focus of the combined lens required is multiplied by the focus of the lens to which the magnifier is to be fitted, and the result is divided by the difference. Thus, if we have an 8 inch lens, and wish to make it a 6 inch one, we multiply 8 by 6 and divide the result, 48, by 6 subtracted from 8—that is, 2. As 48 divided by 2 gives 24, we learn that a magnifier of 24 inch focus will make the 8 inch lens a 6 inch one.

PATENT NEWS

Under this heading it is proposed to include each month a list of all the U. S. Patents; and brief abstracts of the more important, and to include also such foreign patents as present special features.

Copies of any patent can be obtained from the Commissioner of Patents, Washington, D. C. Price, five cents each.

- M. P. Machine. H. M. Connor and D. D. Miles. 1234136.
 Photographic Camera. Harry L. Ide. 1234339.
 Apparatus for Washing or Developing Photographic Plates and Films. R. Kersten. 1234346.
 Air-brush. C. H. Parkin. 1234378.
 Process for Recovering Silver from Weak Photographic Solutions and Emulsions. F. F. Renwick and B. V. Storr. 1234391.
 Print-drying Machine. W. E. Stromberg. 1234410.
 Printing-frame. E. W. Sewigard. 1234416.
 Film-handling Device. C. F. Jenkins. 1234545.
 Blue-printing Machine. F. F. Metzger. 1234554.
 Photographic Developing Tank and Rack. B. M. Dickson. 1234641.
 Method of Thickening or Drying Solutions, Emulsions, etc. P. Askenasy. 1234714.
 Film-holder. F. W. Pratt. 1234800.
 Photo-engraving Method. W. Eppers. 1234888.
 Automatic Film-feed. C. Spiro. 1235073.
 Camera. W. D. Marshall. 1235222.
 Release Mechanism for Photographic Shutter. Andred Wollensak. 1235273.
 Flash-light Apparatus. Oliver A. Bradshaw. 1235282.
 Photographic Camera. H. L. Ide. 1235320.
 Projection Apparatus. A. Ames. 1235752.
 M. P. Projecting Machine. F. L. Dyer. 1235776.
 Method of and Apparatus for Marking Photographic Materials. A. A. Rutten. 1236007.
 X-ray System. C. E. Campbell. 1236051.
 Photographic Plate Holder. S. A. Mischansky. 1236201.
 Film-feeding Mechanism for Cameras. L. F. Corrodi. 1236271.
 Cinematographic Apparatus. J. Kleidman. 1236319.
 Aviator's Camera. W. F. Folmer. 1236419.
 M. P. Film. W. E. Williams. 1236639.
 Printing-frame. C. De Marcus. 1236683.
 X-ray Apparatus. J. W. Wantz. 1236792.
 View Record Mechanism. F. J. Bulask and F. J. Koellar. 1236819.
 Lens. M. Zwillinger. 1236895.
 Photographic Apparatus. O. V. Greene. 1236928.
 Device for Cleaning Films. A. S. Howell. 1237047.
 Automatic Film Control. H. H. Heckman. 1237333.
 Loading Device for Cut-film Frames. A. M. Schoenberg. 1237563.
 Photographic Developing Apparatus. R. Kroedel. 1237657.
 Printing-frame. J. A. Robertson. 1237701.

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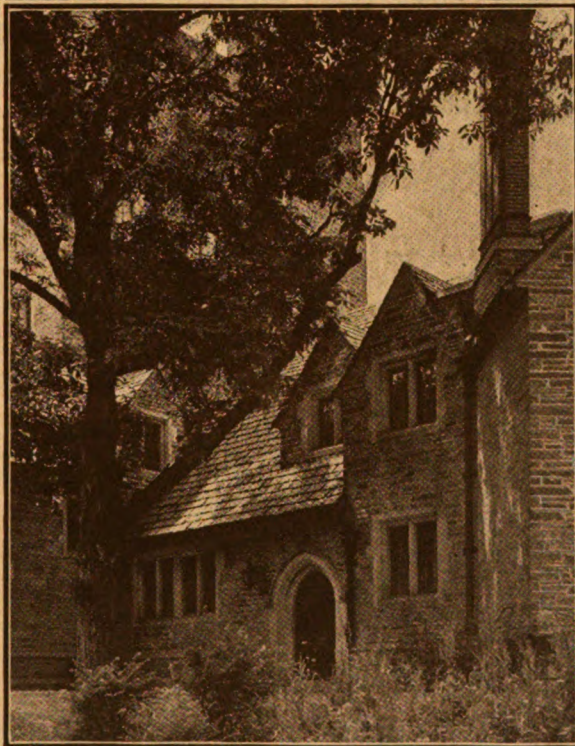
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NUMBER 11



By Roger B. Whitman, New York

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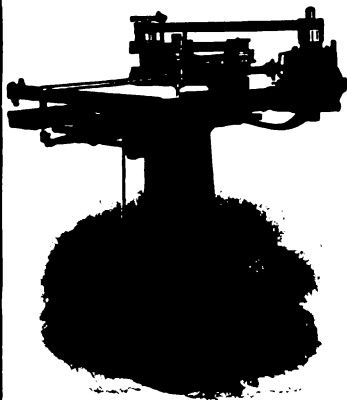


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THE OIL TRANSFER PROCESS'

By ROBERT DEMACHY

ALL photographers know that the collotype process consists in inking a relief produced by the action of light on bichromate-sensitized gelatin, and in printing with this inked relief on paper by means of a press.

Mr. Rawlins stopped at the first stage. Really oil prints, from a technical point of view, are nothing else but collotype plates of a sort waiting for the pull.

The superiority of this oil process consists in the manner of inking which affords the operator a magnificent liberty of control. Its inferiority is due to the impermeability of the gelatin film on the surface of which the printing ink, which is intended for ulterior dissociation, remains entire, a mixture of pigment and oil, and in the peculiar aspect of this gelatin surface which when left uncovered, or when thinly covered, adds

nothing to the beauty of the picture, not to say made it worse, to say the least.

Artists in black-and-white do not use double-transfer paper for printing their etchings, their dry prints, or their mezzotints; they have good reasons for preferring Dutch or Japanese paper. The same reasons have made me anxious from the very outset of my work in oils to take advantage of hand-made paper as a substratum for my pictures; in other words, to go a step further in the collotype process, and to use my pseudo plate as a printing plate. But I was deterred for a long period from any experiments in that quarter by the terrifying prophecies of divers experts in collotype, who predicted a series of dire catastrophies culminating in the final amalgamation of gelatin and transfer paper. Really these gentlemen did me good service, for I doubt if my experience in oils would have been at that time equal to the task I have since then undertaken.

¹ A paper read before the Royal Photographic Society of Great Britain.

My first experiments were made in unfavorable circumstances. I had no press of any kind, and was obliged to use one kindly lent by one of my friends, an etcher, whose studio was far from my workroom—far enough to make me fear that my prints would dry during the journey.

I chose No. 118 Illingworth double-transfer paper, whose film takes the ink well and holds it badly, gave a short exposure, inked the prints liberally, and rushed them to the printing press packed in an elaborate arrangement made of cardboard, corks, and wet blotting paper. There was a good deal of unavoidable delay at my friend's studio, and the prints were not passed under the cylinder until more than an hour after they had been inked. Nearly all the deepest blacks remained on the gelatin, but the half-tones were splendidly transferred. The transfer paper stuck to the gelatin in several places, but it was ancient Japanese and liable in all cases to lose its fiber. On the same day, in the afternoon, I made a second trial with better success, and though my transfers were far from perfect, still they showed novel qualities that were sufficiently suggestive to induce me to buy an engraver's press and to begin a series of experiments which I pursued strenuously from December to March, when I showed some transfers at the exhibition of the paintings of the "Artistes Amateurs" Society in the Champs Elysées. Since then I have shown several at the Photo Club Salon and about fifty examples at a private show at my studio in Montmartre, where I had the opportunity of profiting by the advice and criticisms of a number of artists in black-and-white.

The process is, like all difficult processes, simplicity itself. You ink a print on double-transfer paper, cover it with damp paper, and press both sheets together with some appliance or other—in my own case with an engraver's press. Separate the sheets and you will find that the ink has been transferred from the gelatin to the paper; but not always with perfect success, certain conditions being neces-

sary for the maintenance of a satisfactory average.

I would like it to be understood before entering into technical details that the instructions I am now giving in regard to the working of transfers are anything but dogmatic; I am simply telling you how the pictures that are on view this evening have been made; and I, first of all, admit that there are a hundred and one other methods of making them. In fact, any strong or prolonged pressure, from that of the office copying press to that of the steam hammer, will make an oil picture pass from gelatin to paper; and any sort of paper, rough or smooth, sized or unsized, damp or dry, will be ready to receive it. There is no secret formula about this, nothing but a recognized physical fact. But, on the other hand, if we have formed beforehand a special conception of what the transferred picture ought to be, if we have been prudent enough to build up an ideal, then the trouble will begin. It is not simply for the pleasure of an excursion into the unknown that I have studied the transfer process, but because of certain qualities in certain transfers that I had not found elsewhere. But these qualities do not exist necessarily in a transferred oil print.

They are the results of certain conditions which at first I failed to recognize, and which, when recognized, I found very difficult to reproduce with any degree of certainty. For instance, I can say that the velvety quality of the blacks in a successful oil transfer is due (1) to the nature of the negative; (2) to the degree of exposure received by the double-transfer print; (3) to the manner of inking the print; (4) to the nature of the transfer paper; (5) to the degree of moisture; (6) to the degree of applied pressure.

An error in one of these conditions is sufficient to impair seriously the quality of the deep shadows of the transferred picture. But even if everything has gone wrong and the beginner has sinned six times, he will still produce a transfer; and of course it will be that description of transfer that will give the

process its average reputation. It has been so with oils and before that with gum.

The Negative

Gum bichromate allows of a considerable latitude in the kind of negative. There are now and then happy accidents, so to speak, that enable one to obtain a good picture from an indifferent negative. In the case of oil prints this latitude is narrowed exceedingly, yet certain defects of the negative may be effectively hidden by a clever worker (note that I am not alluding to photographic values, but to the result of over- or under-exposure or of badly conducted negative development). With the transfer process the margin is still narrower.

In order to produce a mellow, velvety transfer one simply cannot do without an excellent negative, a better one even than the oil process demanded. It must be strong, detailed, and clear.

The Gelatin Papers

On this subject, as on several others later on, I shall be obliged to keep within the limits of my own experience. I do not know how bromoil papers will behave for transfer work, never having inked a bromoil print in my life. The papers I habitually use are Lamy, Illingworth, and Autotype double-transfer papers. They all work beautifully, though some can furnish a greater number of pulls than others.

Inks

It is the same with inks. I have tried quite a number of samples and have ground special inks myself (I have not had the opportunity of trying the English specimens of oil paints), but finally have come back to those I have been using for the last four or five years, Taille Douce and lithographic encre machine, to which I add collo-graphic ink in various proportions.

In fact it is the Taille Douce ink that gives the richest tones, but it is not tacky enough to be employed pure. It is better mixed with collo-graphic or lithographic ink.

Papers for Transfers

Any kind of paper will take a transfer, and interesting experiments may be made with unusual brands. I have a preference for Dutch Van Gelder paper and for French Arche paper. There is a sufficient variety in grain, degree of sizing, and color in both the Van Gelder and Arche papers to meet all requirements.

The Press

I use a copper-plate press for my transfer work; but other photographers, M. Billard for instance, have made experiments with an ordinary copying press. The results are somewhat different; up to now I still prefer the effect of linear to that of platen pressure. This last style of pressure will succeed better with the majority of photographers because it reproduces detail with superior sharpness.

Exposure and Inking

Whatever sort of press has been adopted, certain precautions have to be taken in the exposure and inking of the oil print. The exposure must be short. Of course there is a limit, and that limit is the subsequent impossibility of making the ink take elsewhere than in the shadows of the picture. But it is from this limit that the time of exposure must be worked up to normal. Avoid over-exposure, above all, for transfers from over-exposed oil prints, even if the print has been worked up to what appears proper contrast by skilful local manipulation, will be soft, woolly, and insipid.

But even a properly exposed print from a good negative will not yield a satisfactory transfer if it has been inked according to the habitual standard. Usually at this point it would be pinned on to a drawing board and set up to dry; but, if it is intended for transfer, the shadows and especially the darkest blacks must now be over-charged with ink. If not they will come out gray on the transfer paper. On the contrary, the half-tones and high lights will be left just as they are,

for they will pass as they are from gelatin to paper. The explanation of this peculiarity will be found in the behavior of different layers of ink according to their level. The ink layers covering the gelatin reliefs being thinner and also at a higher level than the rest will pass easily on to the transfer paper. It is the same thing with semi-high lights and half-tones, but the deep blacks being on a lower level sustain less pressure and are less in contact with the transfer paper. Their surface must be raised by extra inking to that of the half-tones. Other factors come into play, but the most important are no doubt those above described.

Still, even though the exposure and inking have been successful the transferred picture may be bad, if the transfer paper has been wetted too liberally. It is difficult to express in words the precise degree of dampness required. Only repeated trials will enable us to ascertain this. That is the worst side of pictorial processes—one cannot write out a nice compact formula for the use of indolent workers. I can only say that the transfer paper must be allowed to dry to the point of having lost all visible surface moisture, but without any dry patches being apparent when held against the light. It must be supple and cool to the touch, and without any tendency to cockle.

But I hasten to add, in order to suppress ulterior discussion, that absolutely dry paper will take a transfer easily; the result, however, will not be the same, and the difference will be perceptible to any artist who has worked at transfers for some little time.

The importance of a correct degree of moisture in the paper will be evident to anyone who has some idea of the reasons for which a transfer takes place. There must be some reason for the ink to quit one support for another. If there were none, no amount of pressure would enable us to make an oil picture pass bodily from gelatin to paper. It is easy to explain this state of things, without explaining anything at all, by ascribing it to a matter of affinity. But as this affinity changes according to the degree of moisture, and as we know by experience that

wet paper loses all affinity for ink, we may draw the following inference from the above fact, viz., that water repels greasy ink, and that a transfer can satisfactorily take place from gelatin to paper only when the paper is less wet than the gelatin.

But it does not follow that the drier the paper the finer the result. There is an intermediate degree, between wet and dry, which adds to the completeness of dry transfer the mellowness of damp transfer.

May I venture to answer, before they are made, certain criticisms that are easy to foresee? It will be said that transfers from oil prints are not photography. I admit that the pigment on my transfers has been fixed on paper by pressure, and not by the direct action of light. But this pigment has been bodily transferred from a relief produced by the direct action of light. In the carbon double-transfer process the final transfer paper has not been sensitized either, the only difference being in the fact that the pigment in the carbon process is mixed with the gelatin before light action has taken place, while with oils it is applied after. The fact of passing a photograph from one support to another is not enough, I should think, to rob it of its name.

Lastly, the peculiar aspect of these transferred oil prints will probably shock these same photographers who disfigure their negatives with paint, methylated spirits, pumice stone, and penknife work to such an extent that renegades like myself hesitate to recognize them in their latter state as negatives. They will accuse me, no doubt, of plagiarizing engravings, because of a print mark somewhat like a plate mark, which is unavoidable, and because I use engraver's ink and Dutch paper. It must have been much worse in the "fifties" for the first photographers who printed on salted paper after the Daguerre silver plate was superseded. All new processes are anti-photographic until a newer one comes in, and this one is our old and ugly friend, collotype, partly modified as to the method of inking for the use of pictorialists, but still collotype.

THE PROFESSIONAL PHOTOGRAPHER AND THE REFLECTING CAMERA

By C. H. C.

IN case there are some whose attention has been so strictly confined to the gallery end of the business that they have no knowledge of a mirror camera, let it be said that a mirror camera is one which has a horizontal ground glass, and a mirror, set at an angle, which reflects the image formed by the lens to this horizontal ground glass. This ground glass is the same distance, optically, from the lens that the focal plane is. Over the ground glass is erected a hood, through which the operator looks. The mirror acts as an erector for the image, turning it right side up. The distances being the same to ground glass and focal plane, the image, as viewed through the hood, is the same size as the finished picture.

When a picture is to be taken, the operator focusses the lens by turning a convenient milled head, watching the full-size, right-side-up image on the ground glass, through the hood. When it is as he wants it, he presses a button. This button releases the inclined mirror, which flies up out of the way, closing off the ground glass and making a light-tight joint. When it is seated, and not before, it releases the previously set focal-plane shutter. The "lag" in time between pressing the button and the release of the shutter is a very small fraction of a second—possibly a twenty-fifth, so the picture is made just as it is seen, at the time it is seen, on the ground glass.

This, in effect, is the reflecting type of camera. On this side of the water the most prominent example is the Graflex. The advantages of a focal-plane shutter have already been discussed by me in these columns, so nothing further need be said on that head, except to remark that all that applies to a focal-plane shutter in any camera applies to it in a reflecting instrument.

Now, it should not need much demonstration to see that for any subject which is in motion, or liable to move, an instrument which allows focussing to be done to within one twenty-fifth of a second of making the exposure puts a great power in the hands of the photographer. Two men making pictures of a dog. As fast as the one gets his tripod instrument set up, focussed, slide drawn, and is ready to press the bulb, our canine friend gets up and lies down three feet nearer the camera. Or he moves out of the line of vision—and in either case, refocussing and the same with the "fo" left out becomes essential. The other man, with his hand camera, merely adjusts the focus while looking at the dog, and presses the button as soon as his dogship assumes the position desired. If the position is but momentary, it is long enough. I remember some experiences with sheep, than which no more nervous and un-stand-stillable animal exists, in which a Graflex produced picture after picture that set the owner frantic with delight, while a stand camera failed utterly in everything except frightening the timid animals out of what little sense they were provided with in the first place.

When it comes to photographing a jumping horse, the stand camera is all right if you know which five-barred gate he is going over, and can get exactly where you want and focus on the gate in the first place. But otherwise, if you are not absolutely certain that the horse is going to occupy a given position in the atmosphere at the time you want to make the picture, you are necessarily quite helpless without a reflecting camera.

And as for children! If you do child work in the studio, you have no need of any one to write an exposé of your troubles. But if you have tried children in natural surroundings with a stand camera, you may be glad to have some

one voice the complaint every one makes of such pictures: If without motion, they are stiff and unnatural—the sitters knew they were being photographed; if natural in pose and expression, they are either out of position or show movement. With the reflecting camera indoors it is frequently possible to photograph the squirming baby, because of both the ability to focus a squirm and get enough light on it—combination of mirror and focal-plane shutter. Outdoors you can loaf about with playing children and picture them, time after time, when they are unconscious of your work. The result is the kind of picture that sells.

Now, I would not pretend for a moment that just because you expend good money for a reflecting camera you are bound to die rich, or that you will have trouble dodging the dollars and finding time to write up your order-book. But if your town is like other towns, and if your customers are of the same kind as most people's customers, you will find that just as your equipment provides for varying and various kinds of work, so you will have various and varying kinds of work to do.

You will not experience any particular difficulty in learning to manage a reflecting camera; but you will have to revise your system of outdoor timing, since focal-plane exposures are faster, light for light, than other kinds of shutters. You will also have to learn to allow for the tiny fraction of a second of "lag" between pressing the button and the release of the shutter, but this only in very fast movement. You will have to learn the allowable speeds for various degrees of movement, at different distances from the camera and at different angles—a matter of small difficulty—from tables provided for the purpose.

You will not have to learn the convenience of the instrument. Once you have used it you will want to take it straight to your studio and use it there; nor, if you have a fast lens and a good light, is there any reason why you cannot use it there. In fact, the use of the reflecting camera in the studio for baby

and pet animal work is one of its great recommendations to the professional, since by its aid he can obtain pictures utterly impossible—or at least, extremely difficult—with any camera in which a measurable interval of time must expire between focussing and the release of the shutter.

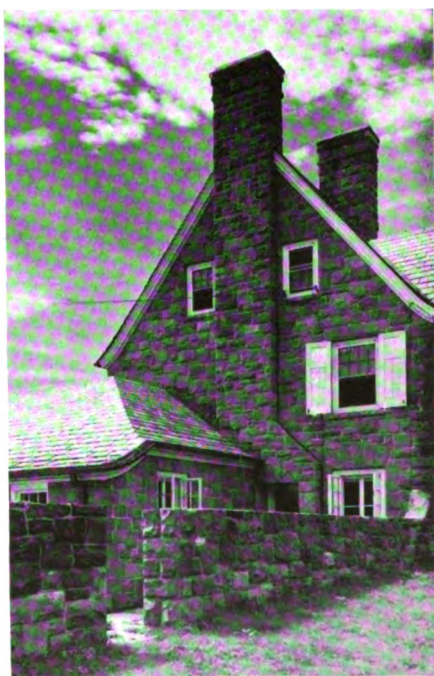
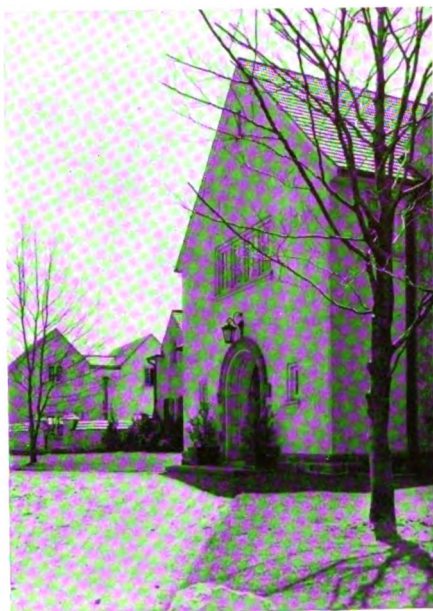
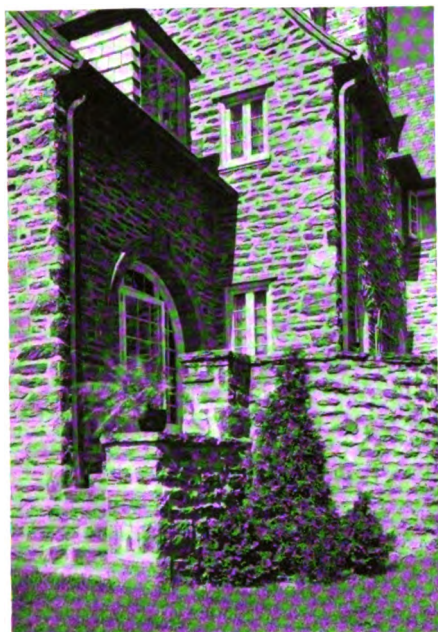
You will wonder, perhaps, at my saying that snapshots in the studio can be made with the reflecting camera held in your hands; but as it is not only feasible, but perfectly easy to make such snapshots with such a camera, in an ordinary light front room, there should be no difficulty whatever under the light.

Of course, you cannot screen down your light and get Rembrandt effects and expect to use a mirror camera at even its slowest speed and with the fastest lens and get fully timed negatives. But with an uncurtained light and a good lens, and a bright day, you can use the focal plane at one-tenth to one-twenty-fifth of a second, see what you are doing on the ground glass, press the button when you see what pleases you, and be sure—particularly if you use the tank—of a well-graded, fully timed, properly developed negative.

When you think of the ability this puts in your hands, the facility with which you can walk all around not only a baby, but a grown-up sitter, observing any change of expression and any alteration of expression, with the ability to take what you see the instant it appears and before it is gone in another change, you will realize what the mirror camera does for you.

That it is not more used is nothing against the instrument, but an argument against the ignorance of its possibilities which generally obtains among a large proportion of the profession.

Yes, they cost money. The makers don't give them away. And a fine lens costs money. And the spending of it in a tool or appliance of this kind, which can be made to pay dividends in so many differing ways, is one of the surest assurances that the money you want to make is hiding around the corner, only waiting your invitation to come forth.



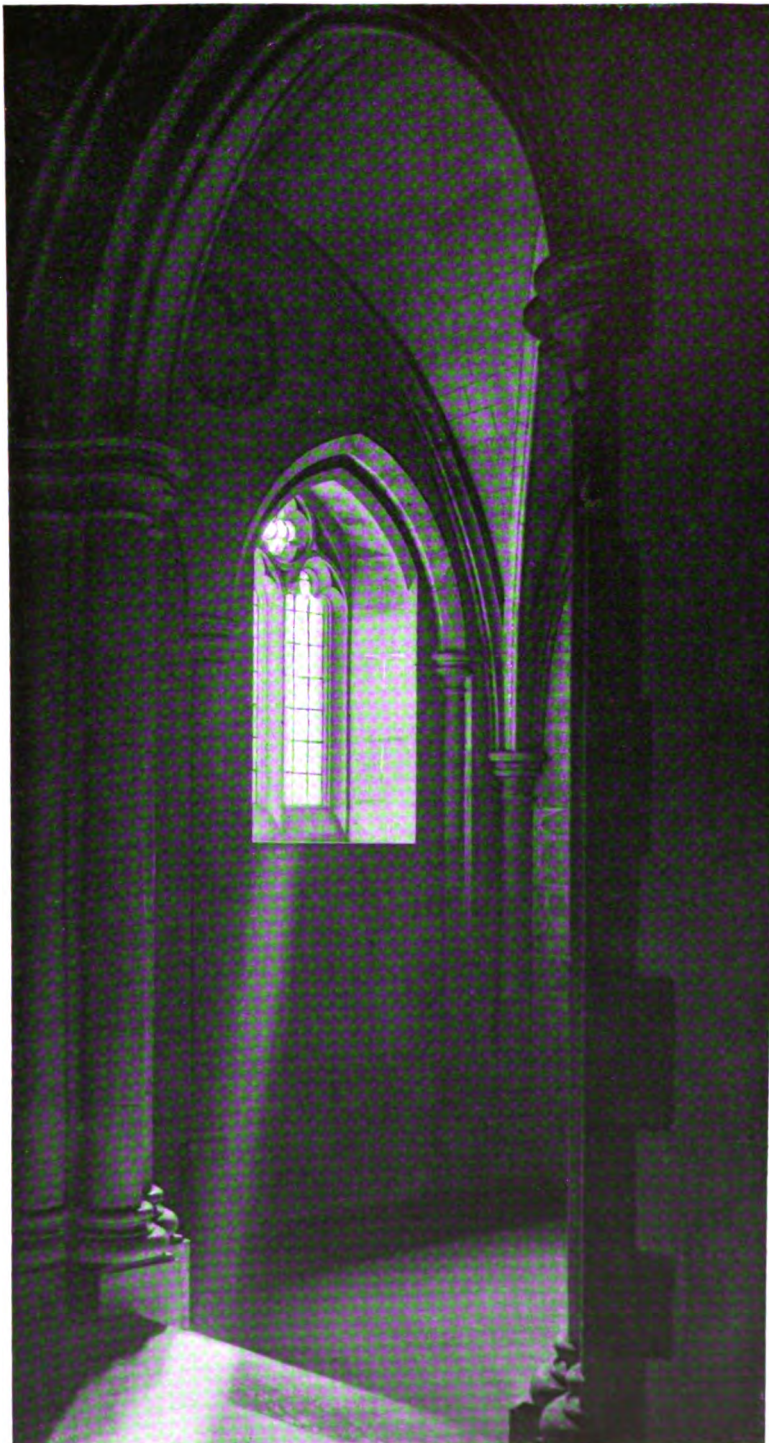
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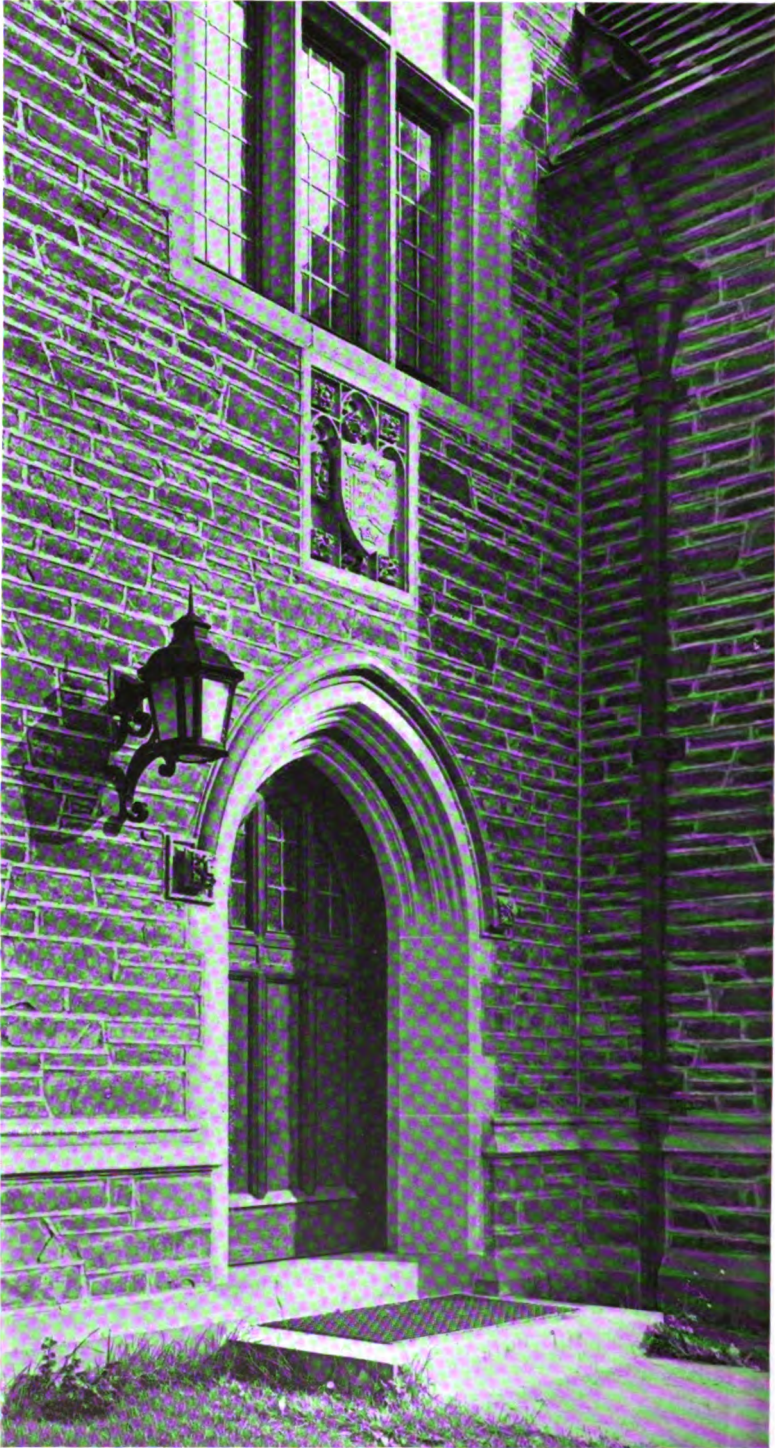
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A DEVELOPER FOR PRODUCING PRINTS OF EXCEPTIONAL BEAUTY

By "CHEMIST"

DURING the past three years a great deal of experimenting has been carried on with a view to obtain a suitable developing agent that would replace metol, a chemical which the United States has hitherto been entirely dependent upon Germany to supply. The combination of this chemical with hydroquinone (oxybenzine) had become almost universal. Metol, whose chemical name is monomethyl-paramidophenolsulphate, has been surpassed, particularly in first cost, by the following chemical: Paramidophenol-hydrochloride, sometimes called kodelon. Next to pyrogalllic acid an iron developer was brought out to dry plates and paper by M. Carey Lee, and W. Willis, some years ago, by using protosulphate of iron with potassium oxalate. The following developer differs materially by using ammonium oxalate with free oxalic acid and pure ferrous oxalate, all of which chemicals may be made in America from American material, while the potassium oxalate was another ferrous product.

Although ferrous oxalate in combination with potassium oxalate has been used for developing purposes (*in a perfectly neutral state*), the use of the ammonium salt in combination with a *free acid* is a new combination for photographic use. A considerable number of tests have been made extending over a year, to prove the thorough practicality of the combination as a reliable photographic developer, both for paper and lantern slides, rendering a delicacy and beauty hitherto not attained.

An Acid Iron Black Developer

Ammonium oxalate . . .	2 oz. av.
Ferrous oxalate . . .	3 dr.
Oxalic acid . . .	1 dr.

Dissolve the above in 12 ounces of *boiling* water in an enamelled saucepan. Stir until the liquid assumes a deep orange color, then add 8 ounces of cold water and 2 drams of pure alcohol (*not*

denatured, or weak alcohol). As soon as the liquid has become quite cold it will be ready for use.

Developing Prints with the Above

Pour 5 ounces of developer into a clean tray, expose the paper in the usual way upon a negative, either by artificial or weak daylight, then under a yellow or orange-colored light, place the exposed paper into the developer, rock the tray slightly, when the image will appear in the course of two or three seconds. Ten or fifteen seconds will complete the development. Remove the print, drain off the developer quickly, and dip the print completely into a tray of acid water composed of:

Water	12 fl. oz.
Acetic acid, No. 8	1 fl. oz.

Remove the print quickly and place into the fixing solution, composed of:

Hyposulphite of soda	4 oz. av.
Water	20 fl. oz.

Change the prints over and over in this bath for a period of from five to eight minutes, so as to ensure perfect fixing, then wash them in another tray of clean water, allowing the water from the faucet to run over them for fifteen minutes, then place them into a clear solution composed of:

Powdered alum	1 oz. av.
Water	20 oz.

Five minutes in this will harden the surface of the print, when they must be washed for a quarter of an hour in running water. They may then be removed, blotted off, and dried.

When prints made upon glossy papers are developed with this developer they present unusually brilliant blacks in all the shadows, and uniform in quality throughout. This preparation is essentially a paper print developer, although

fine lantern slides may be developed with it. It may be used until exhausted. It should be kept in a *white* glass bottle, because it deteriorates somewhat when kept in an amber-colored bottle. As it becomes exhausted, it returns to the color of water, quite unlike the organic developers which become discolored even to blackness by use. There is a very valuable point to be considered in the use of this developer. It may be renovated in developing power repeatedly when exhausted. By reheating the mixture in an enamelled saucepan to boiling-point, including any deposit formed, then by adding 2 or 3 drams of ferrous oxalate to the hot mixture, the salt dissolves freely, and the solution becomes a deep orange color again, and when cold it will develop with as much energy as it did in the first place. The intense blacks of the prints developed in this reinforced developer will be of a fine blue-black in place of a jet-black. This operation may be repeated several times, thus it forms a very economical developer, which in the long run makes this developer one of the most economical. Ammonium oxalate and ferrous oxalate may be readily made by anyone desirous of doing so in case these chemicals are not readily procurable.

Making Ammonium Oxalate

Prepare a *saturated* solution of oxalic acid in hot water in a stoneware vessel. Add thereto powdered ammonium carbonate, stirring with a glass rod thoroughly between each addition. Strong effervescence will take place, add repeatedly the carbonate until effervescence ceases. Stand the vessel aside for twenty-four hours, when it will be found that a crop of beautiful white crystals have formed, occupying fully half the vessel. Drain off the clear liquor, preserve this in either a glass or stoneware vessel, allowing this to evaporate spontaneously, so as to obtain all the ammonium oxalate formed. The first batch after well draining may be spread out upon white blotting paper, to dry in a warm place. When dry these

crystals constitute ammonium oxalate $(\text{NH}_4)_2\text{C}_2\text{O}_4 + \text{H}_2\text{O}$.

Making Ferrous Oxalate

Dissolve in 3 pints of warm water, 1 pound of protosulphate of iron, stirring occasionally until all the crystals are dissolved. In 3 pints of warm water dissolve $\frac{1}{2}$ pound of oxalic acid. As soon as this salt is dissolved and both solutions have become cold, add the oxalic acid solution to the protosulphate of iron solution, stir the mixture well, and allow to stand for several hours. The bright yellow precipitate formed is ferrous oxalate. Pour off the clear liquid, add more cold water, stir well, then when settled again pour this water off, add a second lot of water. As soon as the precipitate has settled again, pour the whole into a filter paper placed in a glass funnel (a filter paper may be made out of a sheet of white blotting paper), pour cold water over this a few times to secure complete washing of the precipitate; when drained well for about twelve hours, turn the precipitate out upon folded blotting paper, spread it out, allow it to dry in a warm place *spontaneously*. As soon as it is quite dry it may be crushed to powder with a bone knife or a wooden ruler with ease, because this product is very friable. The resulting powder is ferrous oxalate, $\text{FeC}_2\text{O}_4 \cdot 2\text{H}_2\text{O}$, which when mixed with the ammonium oxalate, as described, will produce the developer from the formula given. The proportions given will yield 10 ounces of ferrous oxalate.

If it is desired to restrain the action of the developer and cause it to act slower, then by the addition of 10 grains of common salt the restraining action will be very decided; care must be exercised in using any restrainer, especially potassium bromide, which acts very powerfully, in fact 5 grains of this salt would stop the developing action entirely. Restrainers will alter the color of the deposit of the print inclining to a brown, in fact, brown-black would be the color. If restrainers are used then the time of exposure must be increased. Plates developed with this developer, for use

in the optical lantern, will appear to be somewhat thin; the delicacy and well rendering of every detail, however, is superb. These plates may be intensified to almost black-and-white by the use of the following intensifier, which will leave nothing to be desired:

Intensifier for Lantern Plates

Water	15 fl. oz.
Bichloride of mercury	60 gr.
Common salt (chloride of sodium)	60 gr.

The lantern plate must be well washed previously to rid the film of all traces of hyposulphite of soda. Then place the plate into the above, let it bleach white all through, remove it, and wash it well under the faucet, lay it face up in a clean tray, and pour over it the following solution, stirring it well before use:

The Blackening Fluid

Water	5 oz.
Strong water ammonia	$\frac{1}{2}$ fl. oz.

In the course of four or five seconds the bleached plate will blacken all through the film. It should then be well washed under the faucet for ten minutes, then placed in a rack to dry, when it will be ready for mounting for use in the lantern. Films developed with this developer, especially moving-picture films, produce a very delicate image, with *every* minute and weak detail rendered with more decision than the usual developers give. Intensification of such films, however, will give, where intensified by the formula given, either negative or positive films of a very superior quality, capable of rendering upon the screen, transparency of effect, in place of the crude black and muddy high-lights so often seen in moving-picture displays. An excellent restrainer for this developer, and one that causes a perfect rich-brown deposit, is produced by the addition of a few drops of a 10 per cent. solution of phenol or carbolic acid.

PERSPECTIVE FOR PHOTOGRAPHIC ARTISTS

By ARTHUR WHITING

TO enable the photographer to insert pictorial backgrounds on enlargements a knowledge of the laws of perspective is often required, and we give below a few rules for reducing simple objects (as interiors) to perspective. As everyone is aware, the further off an object is from the eye the smaller it appears, until even large buildings become mere specks in the distance and finally vanish entirely. *The point at which they disappear is called the vanishing point (V. P.).* For instance, if we gaze upon a perfectly straight and level track of railway lines from the center of the track, the lines appear to become smaller and nearer together until they meet at a common point and then vanish altogether. If we now repair to the left-hand side of the track and stand a little away, looking toward

the track, we notice the rails appear to rise higher and get closer together the further they are from the eyes. They rise (or appear to rise) higher *because they are below the level of the eyes, but they do not rise above the level.* But, on the contrary, the telegraph wires which are above the level of the eyes, appear to descend the more they are away from us, and the posts appear shorter and shorter, until both posts and wires (if we can see far enough) apparently meet the rails on a level with the eyes, and then vanish in the distance. This is the vanishing point (V. P.).

If we now turn our eyes to the left and view the surrounding objects we find exactly the same thing happens, so that we have vanishing points to the right and to the left of us. Suppose we try to depict these objects on a piece

of paper, we at once find we are bound by the limits of the paper, and the more of the subject we want to get in the smaller we have to make the scale of our drawing. To make this clear remove the back from an empty printing frame and look through it, say, at a foot away from the eyes. You see so much of the scene before you; but hold it two feet away and you see considerably less, for the nearer you hold it the wider the angle of view, and the further away, the less it becomes. And so the size of our drawing paper is our "picture limit." (P. L.)

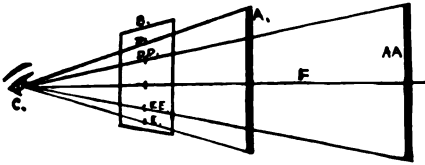


FIG. 1

Now take a lead pencil (Fig. 1, A), place a short distance from an assumed picture limit (B), on the other side of it from the eye of the observer C. The lines D and E passing through the P. L. give the size the image will appear on the picture at that distance from the observer. Remove the pencil further away, as at AA, and then the lines DD EE give the smaller size of the image at this greater distance. This size of the image as governed by the distance it appears to be is called the "picture plane" (P. P.), and the points C and the extremities of A, or AA, are the three corners of the "visual angle."

The vanishing points for drawing a picture in perspective are obtained from the visual angle, and are placed in their proper position on the line of sight or "horizontal line," F, the details of which we may easily learn from the following object-lesson. Let us suppose we have an enlargement with a white or block-out background on which we wish to draw an interior, say, the corner of a room, with a window on one side, the "elevation" of each wall singly being as shown in Fig. 2, the height of the walls to be represented as nine feet, and that of the windows four feet and

four feet wide. On the floor we wish to make a representation of a tile covering, each tile being, say, 1 foot square.

The walls being at right angles to each other, we draw a right angle on the upper part of a piece of paper (Fig. 3, AA), the sides of which equal in length those of the elevation (Fig. 2).

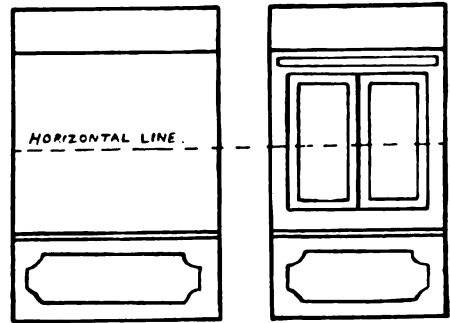


FIG. 2

Next we take a strip of paper and mark off the distances of the horizontal ends of the panels, cornice, and windows, by putting it against the elevation (Fig. 2) and transferring it to AA, Fig. 3. We now determine the position of the "sitter," say, two feet forward from the outermost extremity of right angle AA, and nearly one foot to the left of the corner where the walls meet. Next draw a vertical line (C) through S, and, determining the eye of the observer to be, say, twenty feet from the sitter (S) continue it downward to that point, O, according to the scale on which we are working.

Then decide how much foreground there is to be beyond the sitter, and mark this distance (according to scale) downward along the vertical line C. Cut a horizontal line through C at this point, and this we will use as our "picture plane" line, P. P.

To find the vanishing points draw a line D from O upward to P. P. on either side of the vertical C line, and at an angle of exactly 45 degrees therefrom, so that the two lines D form a right angle to each other. From the points where these lines cut the P. P. line, viz., E and E, drop perpendicular lines to the "horizontal line," the points where

they meet this line are the "vanishing points" (V. P.). The horizontal line will be that place which represents the elevation of the lens from the floor in taking the portrait of the person we intend to apply our background to, say, for instance, five feet. We will mark off on *C* above point *O* five feet (according to our scale), and a line drawn horizontally (*i. e.*, parallel with *P. P.* line) at this point will be our "horizontal line."

Having obtained these landmarks, draw lines from *AA* to *P. P.* line in the exact direction of *O*, to bring down to the

right angles to *P. P.* Now take a strip of paper, and from the elevation (Fig. 2) obtain the heights of the frieze, panels, windows, horizontal line, etc., and transfer them to the *F* line, taking care that the horizontal point is placed where the horizontal line in Fig. 3 bisects *F*. We can now draw the horizontal lines of the background by placing one end of the straight-edge against these "height" marks and the other against the *V. P.*'s. Draw the left-hand side first, and commence and end the lines according to their places as shown by the vertical dotted lines. In drawing the right-

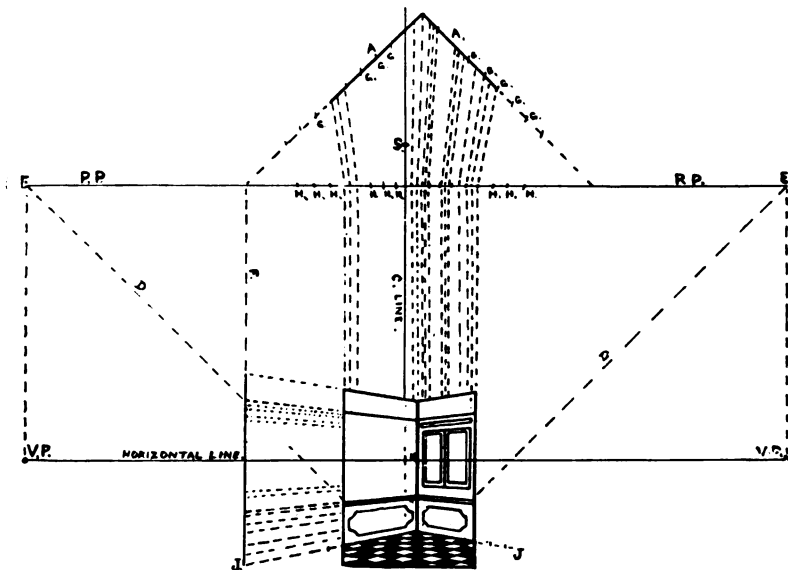


FIG. 3

picture-plane line the horizontal distances of the panels, cornice, and windows. Note that they converge together, being the dotted lines in Fig. 3 from *AA* to *P. P.* When each line touches the *P. P.* line, drop it perpendicularly to about *O*. (In the figure, for the sake of clearness, they are not taken so far. These vertical dotted lines give us the correct dimensions for the horizontal lines of our drawing.

Next we must obtain the heights, and to do this we must continue the *AA* lines to *P. P.*, and at the left-hand side we will drop a line, *F*, downward at

hand side the heights for the window, panels, etc., will be obtained by taking dotted line from *F* to the perpendicular corner of the room, in the exact direction of the *V. P.* But actually in sketching them in, you will draw toward the left-hand *V. P.*

We will now do the tiled floor, and as we determined on a one foot tile, we must mark off their distances on *AA* (as at *G*) and draw them toward *O* as far as the *P. P.* line, where we mark them off (*H*), then drop them perpendicularly (not shown in figure) to the lower angle of the room (*JJ*), and from

these points we draw lines toward the *V. P.*'s, and so get the perspective of the floor.

If we had not decided on an exact size, an easier way would have been to decide on the distance apart we preferred the nearest squares to appear, and having marked off these points on the bottom line of our picture, then using *K* as our vanishing point, draw lines from each mark to that point. This would have given us the center of the diamonds, and then where these lines bisected the lines *JJ* we should have drawn lines to the *V. P.*'s on either side.

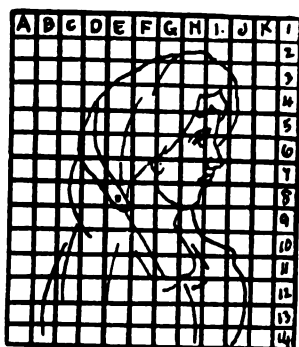


FIG. 4

This example will enable the reader (by applying the same rules) to draw most of the usual scenes in perspective. The chief difficulty he will experience is that it is impossible for him to extend the borders of his enlargement sufficiently to put in the various points correctly, and also that the time it will take will not be warranted, although it is often possible to pin down an enlargement to a large drawing-board (covered with paper) and mark the various boundary lines thereon.

I advise that the artist prepare for after use a few sketches of small size, of designs of his own origin, and keep them as stock. Draw them accurately to scale, and of such a scale as is necessarily required for subjects taken in a photographic studio. Over these drawings (which should be in Indian ink)

let him pencil lines in the form of squares, say, half an inch apart. Suppose, now, he wishes to reproduce a design on an enlargement, he will reckon the number of times the latter is greater than the former, and rule light pencil lines in the form of squares accordingly. If the enlargement is four times greater than the sketch the squares will be two

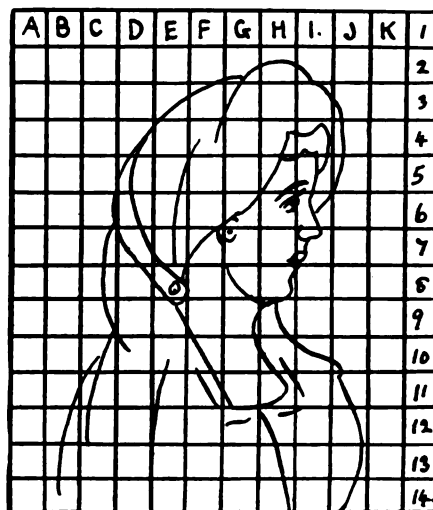


FIG. 5

inches in size, if six times, then three inches, and so on. Then let him draw in, square for square, the lines of the design on the background, and he will find it quite easy to keep not only to the general form, but also of the perspective. When the outline is thus finished the subject may be developed bodily with the airbrush, color, or pastel, as the rest of the subject may be (see Fig. 5). In passing we would point out that this method of reproducing by means of squares constitutes a means of accurately sketching a photograph on an enlarged surface without a photographic basis. The details are easily placed in situation, as it is possible to locate the exact position of each part of the subject section by section.—*British Journal of Photography*.

THE INFLUENCE OF ILLUMINATION IN DETERMINING THE COLOR-QUALITY OF AUTOCHROMES

By NOEL DEISCH, B. A.

EVERY autochromist soon learns that a good, full light during the exposure conduces to the most colorful results. Moreover, he is not long in finding that it is better to choose what a black-and-white photographer would call a "flat" lighting, that in fact entirely successful pictures may be taken with the camera directed away from the sun. One reason for this is that the differences of color in a color-photograph lend it that necessary variety which in an ordinary photograph is given by differences in shade. But a more special reason for avoiding deep masses of shade when taking color-photographs is that they turn up both darker and duller in the resulting positive than they were in the original, if development is stopped just when the high-lights are fully brought out. By this lack of brightness and color they set the lighter parts of the picture into too great prominence, or, stated in another way, cause too much contrast. In great measure this over-darkness of the shadowy portions of brightly lit pictures is due to a lack of latitude in color plates, and in lesser degree to other phenomena that will not be gone into.

But there is also an apparent want of proper color in pictures taken on dull days when the illumination is perfectly even, and which a lack of latitude in the plate would not account for. The uniform experience of workers along these lines is that a decidedly more brilliant color-record may be obtained from a brightly lighted subject than from the same subject under a comparatively poor light, although in the second instance the plate has received a full exposure. This apparent fault has been commonly attributed to some individual peculiarity of the plate. My purpose is to show that very largely it is due to an altogether different cause.

Probably most of us who saw aniline dyes in bulk for the first time were sur-

prised to find that many of them in this solid form appeared nearly or absolutely without color—quite black—but on being dissolved and spread out on paper they exhibited the most intense coloration. A more familiar example is found in the cakes or pans of water-color used by artists. Mauve, for instance, in a wash of the proper depth is an extremely powerful pigment, but in the pan it is so dark that it would be difficult for one to tell at a little distance what its true color really is. On the other hand, some pigments like vermilion (mercuric sulphide), and a number of the yellows appear just about the same in bulk as they do on paper. The natural question is, what causes this peculiar behavior of colors.

The answer will, of course, be familiar to most of my readers. The "black" pigments do not of themselves reflect light appreciably, and show up only by light which passes through them. If they are spread thinly on white paper the light goes through the layer of color to the paper, is reflected, and penetrates again through the color to the outside, and in this double passage all the colors except that one transmitted by this particular pigment are filtered out, and so the emerging light, and therefore the pigment, appears brightly colored. However, if this pigment is in bulk, or if it covers the paper to too great a depth, but very little of the light that strikes it comes back, nearly all is absorbed, and so naturally the substance appears without color, or black. But those colors which appear of their natural tint, regardless of what quantity may be aggregated together, reflect light of themselves without additional help. Their molecular structure is such that they send back light of a certain refrangibility and absorb all the rest, and hence appear of a definite hue. For this reason they require no backing, and, in

fact, are often quite opaque, so that light penetrates them only to a very small distance indeed.

Now all of this has a direct bearing on our subject, because both of these classes of pigments are found in nature. The coloring matter of living things is generally of the first—transparent—variety; whereas of minerals it is as a rule of the second or opaque kind. Plants, for instance, have green chlorophyll in their leaves, and the earth and many rocks are stained red by salts of iron. In nature, however, we rarely find pigments spread over an intensely white reflective surface, like the colors are spread over paper by a painter. They are diffused throughout the substance which they color, a substance that is only imperfectly reflective in any of its parts. Hence the light that is reflected from them comes from various depths within the living structure—some from near the surface, some from further in the interior of the leaf stem, or whatnot, that is reflecting the light.

Observe the conditions closely. That light which comes from the surface of the object will be less saturated with color than the part which comes from the interior, since it will have passed through a lesser thickness or quantity of pigment. So then on a dull day, when the light is of sufficient strength to penetrate only a minimum distance into the object, it emerges with a smaller burden of color than on days when the light is bright, penetrates deep down into the partly reflecting substance, traverses a thick layer of coloring matter, and comes out more completely charged with color. Even the comparatively opaque coloring substances, because they are not *entirely* opaque, behave to some degree in the same way. Therefore, on bright days the colors that usually occur in nature are not only more intense or brilliant, but are also as a rule *actually more pure or saturated* than on dull days. We notice the one without perceiving the other. We see the livening of the landscape under an increasing sun, but unconsciously attribute it altogether to the augmented light, forgetting the role

that color plays in causing the transformation. We do not separate the qualities of light and color in judging either the well-lit scene or the one under an overcast sky, but the color-plate records these colors closely as they are, proper exposure eliminates the difference of brightness that existed in the originals, and consequently the two plates show marked differences of color, notwithstanding they are equally transparent, and we, not recognizing the facts, attribute it all to some eccentricity in the plate.

I suppose the reason that this explanation does not at once occur to a person, or that he is reluctant to accept it, is because he does not ordinarily see too widely distinct aspects of nature in juxtaposition, as they are presented by two such color-photographs, but sees them at different times, and his memory does not serve him well enough to lead him to the truth. Generally alterations of lighting take place so gradually in the processes of nature that the changes of color that go with them entirely escape us. However, there are certain times when we do notice these changes of color, which happens more especially when a rather abrupt difference of lighting occurs. For instance, if one observes a landscape partly obscured by the shadow that falls from a cloud, he will notice that the difference in the actual amount of color perceivable in the shaded and sunlit area is very considerable. One will often remark a similar effect in his room, as it is suddenly lighted up by the passage of a cloud from over the face of the sun. Dark furniture and picture-frames, which were previously of a gloomy monotone, now show beautiful variations of tint in their graining, and the color of one's rugs and books comes out splendidly. If our eyes are prepared for it they will often pick out examples in nature that illustrate the point. Some morning glories are of so dark a tone that in shadow they appear black, but in direct sunlight show up a deep and beautiful blue. Both reflection and observation, therefore, go to show that the disparity in the purity of colors noticeable in color photographs of the same subject taken

in widely different intensities of light represent pretty nearly what is actually the fact, and are due to no inherent and obscure fault in the plate at all.

From the foregoing it follows, and I doubt not that the experience of autochromists will bear me out in my conclusion, that there are certain cases in which a reasonable difference in illumination can result in no defect of color rendition whatsoever. A gaily colored painting, for instance, should photograph well in almost any light. Likewise any object which light, be it never so dull, completely penetrates, such as colors in solution, or, using an example nearer to nature, the petals of most flowers, certain leaves, etc., should photograph equally well when poorly as when brightly illuminated. One of the very best flower pictures I ever secured was taken indoors in the early spring with a heavy, overcast sky. The exposure was five minutes at *f.* 8, but the colors of the resulting diapositive were all that could be wished for. On the other hand, it is just as apparent that certain dark, dull-colored objects demand all the light that one can get on them, because their true glow of color does not appear by mere surface reflection: the light must be made to penetrate into them to bring their latent color to the surface.

An acquaintance with these facts should serve as a guide when making exposures under uncertain conditions of lighting, and of course, as in all questions where design or composition enter, the correct procedure will be determined

very largely by what is paramount in the picture. Where the greater part or the most essential part of the scene contains colors that are dull, lifeless, and what an artist would call non-luminous or degraded, as would apply in photographing a quarry, a gray stone building, or the interior of a somberly furnished room, it would be better to wait until the illumination is at its best to expose an autochrome. But when one is photographing in the flower garden, or making pictures of blond faces accompanied by pink-and-white dresses—when only the brown bark of shrubbery or a deep-hued ribbon will fail to register properly—it would be perfectly feasible to take the picture despite an indifferent light, because then everything that is of importance will show its color faithfully in the resulting picture.

As a closing remark it would be well to state that I do not wish to imply that dulness in pictures taken on cloudy days is in all cases, or in particular cases, altogether due to the cause which I have tried to bring out. It may be the result partly of inexperience, partly of various influences which operate to a greater or less degree under different conditions, and which it would take too long to discuss. My contention is that a seeming dulness in autochromes taken under a poor light, when the plate has been perfectly exposed and carefully manipulated, is very largely due to the fact that the colors in the scene itself have been smothered by an inadequate illumination.

i

A LONG-FOCUS LENS—AND WHY

IT is often very desirable to have a long-focus lens, because it enables us to obtain a larger-sized picture of a given object from a more distant standpoint than the short-focus lens does. The advantage of this greater distance is that a more pleasing view of the object can be taken, giving a better picture. It is well known that a box, for example, if viewed close to, has its horizontal lines “vanish-

ing” very rapidly into one another. Now if this view is transferred to a flat picture the result looks unnatural. Hence the great advantage of long-focus lenses in portraiture and genre photography.

It is commonly explained that with the longer focus-lens on the same sized plate better “perspective” is obtained, because of the smaller angle included, and that, per contra, all wide-angle lenses

give bad perspective. This is quite wrong, perspective being a matter, not of angle of view used, but of the standpoint from which the view is taken. The usual size of plate for which a "universal" anastigmat is catalogued is reckoned so that an angle of views from fifty to sixty degrees is obtained. Now this angle has not been decided on by chance. By common practice for centuries, artists and architects have drawn their views to include an angle of about sixty degrees, as it has been found that this allows the eye free vision and a natural effect. Hence we have always been accustomed to an angle of view of sixty degrees in viewing pictures, and it is only right to choose the same angle in photography. Two facts in confirmation of this view may be noted. Many of the "impressionist" painters have used a larger angle of view in their pictures, and this accounts for much of the unnaturalness which we associate with impressionist paintings. On the other hand, the cinematographer has gone to the other extreme, and rarely uses a larger angle of view than thirty degrees. This is partly because the lens he uses has to be extremely rapid, and in photography rapidity of vision is inconsistent with breadth of view. The effect of this is that, in watching the cinematograph, the eye has a cramped feeling, as if its view was confined, as in looking through a tube. In views, then, we may take sixty degrees as the field of view for best results; but for single objects—portrait and *genre* photography—that angle need not be regarded at all.

We, therefore, choose our lens of such size as to give a picture on a given scale at the necessary distance from the object. The size of plate now need not be greater than that necessary to include the object, but, of course, it must be at least this size, and the lens must cover that size of plate. The choice of aperture and the amount of stopping down that will be permissible must be decided by the kind of object to be photographed. Machinery, for instance, will require a certain amount of stopping down to bring all the parts into focus, and the longer the focus of the lens the more the stopping down that will be necessary;

but as the machine will stand still indefinitely, the long exposure entailed by the small stop can safely be given. If, on the other hand, we are taking photographs of flowers in a garden, the exposure must be rapid to prevent movement, while the depth of focus required will not be great.

Thus, having chosen our focal length to get a good picture, and our size of plate to include the picture, we must choose our lens according to our requirements in these two matters and to the character of the object to be photographed.

First, there is the obvious method of buying an anastigmat of long focus and similar aperture and properties to the short-focus lens we have been using. This method is rather expensive, as the price of a lens increases approximately in proportion to the square of the focal length. It has the advantage, however, that pictures as good in every respect as those taken with the short-focus lens can be made, with the advantage of larger size or better "drawing." It is, therefore, the method to adopt when good definition is required with either large angle of view or larger aperture. Professionals, therefore, have a long-focus anastigmat either for commercial work (where a large field of view is sometimes necessary), or for portraiture, where a large aperture is essential. Amateurs, however, to whom art is a consideration, will prefer to use one or other of the following less expensive methods.

The second device is to use a lens of the "convertible" type. Here a longer focus can at once be obtained by using either of the halves, giving longer focus at a proportionately less aperture. This has the advantage of not costing any more than the original lens, except in so far as this property has been paid for in the initial outlay. There are two types of convertibles—the eight-lens and the six-lens types. The single component of the eight-lens will usually give good definition over a larger field than that of the six-lens. It can very often be used on a larger size of plate than the complete lens, while this is not so with the half of the six-lens, which, giving good definition over a smaller angle, will only cover the

same size of plate as the whole lens. The eight-lens anastigmat has, therefore, a definite advantage over the six-lens as regards convertibility, but is, of course a much higher priced instrument.

The third expedient exists, with certain types of lenses, of substituting another lens for one of the components, whereby the focus is lengthened; at the same time the field of view and aperture are decreased, so that the same size of plate is covered at much smaller aperture. The supplementary lens is, of course, an extra cost, but the property of conversion is not paid for, whether it is wanted or not, as in the convertible class of lenses.

The last resort is the telephoto lens, by which extra focal length is obtained without increasing the camera extension required. There are two kinds of telephoto lens—the variable magnification and the fixed magnification kinds. In the first a negative lens is fitted behind the ordinary anastigmat, and by varying the separation between the two a certain range of magnifications is obtained. In the second kind a complete telephoto lens has to be bought. In the matter of quality the fixed magnification, while limited as to the focal length obtained, gives good definition over the same size of plate which an anastigmat with the same back focus will cover, and can be made with large aperture, up to $f/6$ or $f/5.4$; while the variable magnification is only corrected for one of the magnifications and the definition sacrificed at the others; and its aperture is

inversely proportional to the magnification. Thus an $f/6.5$ lens, with telephoto attachment, giving a magnification of four, works at $f/25$. The field of view also diminishes as the magnification increases. Generally in a telephoto lens the definition is not quite so good as that of an anastigmat, and the definition of the variable type not so good as that of the fixed type. Furthermore, it is always a rather cumbersome instrument, and requires considerable care and judgment in its use.

It is noteworthy that with any of the above long-focus lenses, except the first kind, there is sure to be a little distortion. This is very often not serious, except in the case of some of the telephoto lenses, especially if used as a narrow-angle lens; it is probably least with the supplementary lenses.

In conclusion, we may thus summarize: If exacting conditions are required for the long-focus lens, it is best to buy another anastigmat. If a little distortion is not serious, and we don't mind the smaller aperture, the eight-lens convertible can be used. If the field of view can also be sacrificed—*i. e.*, we are never using a larger plate than the smaller lens is used for—a six-lens convertible or a three-lens separable type with supplementary lens will meet our requirements. If very great focal length is necessary, everything else must be sacrificed and a telephoto attachment used. If we still require a large aperture, then the fixed magnification telephoto is the lens.—*Amateur Photographer.*

THE DESIGN AND COMMERCIAL USE OF BOX ENLARGERS

By BERTRAM E. HAVELOCK

IT would seem that there is good ground for more extended use than is customary at present of enlarging apparatus of the simplest form such as is familiar to beginners in enlarging

in the shape of the convenient box pattern enlargers supplied by various makers. Here I am concerned not with the requirements of the amateur, but with those of the professional, or more

often the commercial photographer, by whom, so far as my experience goes, comparatively little use is made of this very efficient type of apparatus. Probably this arises from the defective nature, so far as commercial work is concerned, of the box enlargers upon the market. I have nothing to say against these latter in general, for they are remarkable little instruments at the price; but they are fitted with lenses which are of only small aperture, and therefore are unsuitable for quick work with gaslight papers or for use by artificial light. One may take it as a *sine qua non* that any enlarger employed in producing prints under commercial conditions requires to be utilizable by artificial light when daylight is not available. Hence these notes, which will, I hope, go to show that in the box enlarger the commercial photographer has a means of turning out enlargements as simply and almost as expeditiously as prints.

The Small Camera

Perhaps I ought to say a word in preface of the valuable use which can be made, and is being made, of a camera of quite small size for commercial outdoor photography. In the past the photographer who was called upon to make, say, a dozen negatives of outdoor subjects, or even of those indoors, has thought it necessary to use a camera of 10 x 8 or 12 x 10 size, with consequent labor to himself, slowness in operation, and also greater increased cost of plates. The high-class small cameras now obtainable have proved the possibility of securing just as good final results by making negatives of quarter-plate or $3\frac{1}{2} \times 2\frac{1}{2}$ size, and producing prints from these by enlargement. The small camera has the obvious advantages of quickness in operation and greatly reduced cost of plates. The user can probably get through twice as much work in a day, and, unburdened by heavy apparatus, can often secure subjects which otherwise he would not attempt. As many of these commercial subjects contain no moving objects, it is usually possible to employ a moderate aperture of the lens, and thus to

give an exposure of not less than one-tenth or one-fifteenth of a second; or the camera may often be used on a light, rigid tripod, and still greater sharpness obtained in the negatives by further stopping down the lens and giving a time exposure. These are not simply visionary suggestions, but describe practice which many makers of commercial photographs, the writer included, has found to be eminently successful.

Points of the Box Enlarger

The reason why I lay special stress upon the convenience of the self-contained enlarging box as a tool in commercial photographic work is that it lends itself to standardization, and thus can be placed in the hands of comparatively unskilled assistants, whose work will then be fully equal to that obtained by a practised enlarger, once the conditions as regards exposure have been reduced, as they can be, to a simple form. I do not know that there is any particular advantage in using the somewhat more elaborate type of box enlarger which is fitted with a detachable dark-slide; the self-contained pattern, in which the bromide paper is simply laid against a sheet of glass at one end of the enlarger and pressed flat by a hinged spring back, which makes a light-tight joint with the back frame of the enlarger, is almost as convenient when daylight is the illuminant, and sometimes more convenient when the boxes are used indoors by artificial light. These enlarging boxes, though bulky, can be made of very light build, and are therefore easily carried to and fro for loading; but when the place for their exposure to daylight makes it inconvenient to carry them into the dark-room there is, of course, a gain in fitting a detachable holder for the paper. If, however, this is so, it is usually not a difficult matter to pick up for a few shillings dark-slides of old pattern cameras, which with a very little adaptation serve excellently for the purpose.

Degree of Enlargement

Now, as regards the extent to which the negatives require to be enlarged.

About the best average degree of enlargement is three times linear—that is to say, an enlargement of 12 x 9 inches from a quarter-plate negative, or $9\frac{3}{4} \times 6\frac{3}{4}$ from a $3\frac{1}{2} \times 2\frac{1}{2}$. One or other of these sizes of print is usually on a sufficiently large scale for the buyers of commercial photographs, and a degree of enlargement of three times does not depreciate to any appreciable extent the definition in the negatives. However, I may give here a table showing the sizes of prints obtainable by enlarging the two sizes I have mentioned on scales from two to four times.

A degree of enlargement of

2 times		2½ times		3 times		4 times	
Yield prints as follows from negatives of 3½ x 2½ and 4½ x 3½ inches.							
3½ x 2½ ...	4½ x 3½	3½ x 2½ ...	4½ x 3½	3½ x 2½ ...	4½ x 3½	3½ x 2½ ...	4½ x 3½
5½ x 4½ ...	8 x 6	9 x 5½ ...	10 x 7½	9½ x 6½ ...	12 x 9	13 x 9 ...	16 x 12

It will be seen that the quarter-plate negative, owing to its somewhat squarer shape, gives an enlargement which better fits the standard size of bromide papers. It should be mentioned also that in giving the sizes of enlargement allowance has been made for an eighth of an inch margin all round the negative, which, as a rule, does not contain any usable subject.

Dimensions of Box Enlargers

As I have already said, a commercial photographer wants something, in this form of apparatus, better than the cheap enlarging boxes on the market—better, that is to say, in being fitted with a lens of larger aperture. Most establishments will have one or two lenses knocking about which will serve well for the purpose. For the two sizes of camera which, as mentioned above, are the best for the purpose a lens of five inches focal length and of aperture $f/8$, or better $f/6$, is the best which can be selected. Its focal length should be known with fair exactness, say to an eighth of an inch.

The dimensions of the enlarging box depend only on the two factors: (1) scale of enlargement and (2) focal

length of lens. These dimensions are very readily calculated. Let us take first the total length of the enlarger—that is to say, the distance from negative to sensitive paper. The enlarger will actually be about an inch or so longer than this as required by the back to hold the paper. The rule, then, for the total length is as follows: Add 1 to the figure for the scale of enlargement; multiply it then by itself and then by the focal length, and divide by the bare enlargement figure. For example, if the scale of enlargement is 3 and the lens is of 5-inch focus, the total distance from negative to paper is 4 multiplied

by 4 multiplied by 5 divided by 3, or $26\frac{2}{3}$.

The calculation of the distance from lens to paper is simpler. The rule is: Add 1 to the enlargement figure and multiply by the focal length. Thus, with scale of enlargement and focal length as before, this is 4 multiplied by 5 = 20

The distance from the lens to the negative is, of course, the difference between the two lengths already found, but it is just as well to calculate it separately and so to check the previous figures. The rule is: Add 1 to the enlargement figure, multiply by the focal length, and divide by the enlargement figure; thus again 4 multiplied by 5 divided by 3 = $6\frac{2}{3}$. It will be seen that the two second distances when added together make a total equal to the first.

It should be mentioned that in the case of lenses of the older R. R. type it is reasonably accurate to measure these distances from the diaphragm aperture, but that will not always hold good in modern lenses, in many of which the nodes of entrance and emergence are peculiarly placed. In any case it is necessary to make a test of the correctness of focus of the apparatus before finally fixing the three distances for

paper, lens, and negative as can easily be done according to the type of construction described in the next paragraph.

The Box Enlarger

Our enlarging box thus consists simply of a rectangular wooden tunnel of dimensions about half an inch larger each way than the bromide paper to be used. The first thing is to make the receptacle for the paper by nailing a series of strips all the way round inside the tunnel about half an inch from one end, so as to form a thin rebate, on which the glass, against which the paper is to be pressed, can rest flatly. The back or cover is then hinged to the box, so as to provide a light-tight covering of this end. The inner side of this cover requires to have a covering of thick carpet felt or, alternatively, a thin board with its underside attached to the cover by means of one or two shallow springs for the purpose of pressing the paper evenly against the glass when the cover is snapped into place.

Next comes the fixing of a light-tight partition in the tunnel to carry the lens. This partition may be so fixed that the lens diaphragm (if an R. R.), or that part of the lens mount coinciding with the node of emergence (if a modern lens) comes at the calculated distance from the paper. The readiest way of doing this is again to nail or screw four strips of wood in the inside of the tunnel to form a flat support, to which the board carrying the lens can be secured square with the paper.

Then all that remains is to fix a frame to hold the negative. The distance from lens to negative is a comparatively short one, and a very slight difference in it suffices in order to obtain sharp definition on the plane of the paper. The method here is to make a shallow inner frame which will just fit inside the main tunnel, and is provided with a central rectangular aperture, over which the negative is laid, and is held in position by one or two spring clips. This allows of the negative being moved about to any required extent for the purpose of selecting any particular part of it for enlargement, using in place

of an ordinary negative one of the ruled glass screens sold for the purpose, or, in default of the latter, a thin negative with a few fine cuts on it. The final thing to do is to adjust the position of the negative frame in the tunnel so that the sharpest focus is obtained on a ground glass screen placed ground side against the glass which is to serve as the support for the paper. This having been done, the negative frame is screwed into position, and the enlarging box is finished.

The whole of the woodwork employed in making it should, of course, be dead-blackened before putting it together.

It ought to be added that the negative frame may conveniently be fitted with a carrier to take the next smaller size of plate—say, one for $3\frac{1}{2}$ by $2\frac{1}{2}$ in the case of an enlarger to accommodate quarter-plates. In this case, of course, the scale of enlargement remains the same, but a smaller print is produced.

A Box for Various Degrees of Enlargement

Depending on the nature of one's work, it may be of advantage to be able to obtain various degrees of enlargement in a single apparatus of box form. The facility calls for a more elaborate kind of apparatus, but not one which is at all beyond the ability of the handy man to make for himself very cheaply. The principle of its design is that the partition-board carrying the lens shall be set in one or other of various selected positions (according to the degree of enlargement required), and correct sharpness of the enlargement obtained by adjusting the distance of the negative from the lens. This position may be checked by focussing every individual enlargement on ground glass, or the apparatus may be provided with a scale similar to that fixed to ordinary hand cameras and marked to correspond with the different positions of the lens board. Exactly how this will affect dimensions of the apparatus will be seen at a glance by working out the figures, say, for a 5-inch lens and degrees of enlargement of 2, 3, and 4 times. These dimensions are given in the following table:

Degree of enlargement.	Total extension, inches.	Lens to paper, inches.	Lens to negative, inches.
2	22 $\frac{1}{2}$	15	7 $\frac{1}{2}$
3	26 $\frac{2}{3}$	20	6 $\frac{2}{3}$
4	31 $\frac{1}{4}$	25	6 $\frac{1}{4}$

Here we see that the lens board for 2-times enlargement requires to be ten inches nearer to the paper than for 4-times enlargement—a range of movement which is very much less in the case of the negative in relation to the lens board, which, as will be seen from the figures, is only one and a quarter inches. Hence the most advisable design of an apparatus is a long box open at the top and at one end, and provided with a light-tight cover. Nail to each side three pairs of wooden slats, say, of one-half inch square section, each slat of each pair being fixed at such distance apart that the partition carrying the lens will push tightly down between them. The positions for these three pairs of grooves are chosen in the example just selected, so that the distance from the lens diaphragm to the paper is fifteen, twenty, or twenty-five inches.

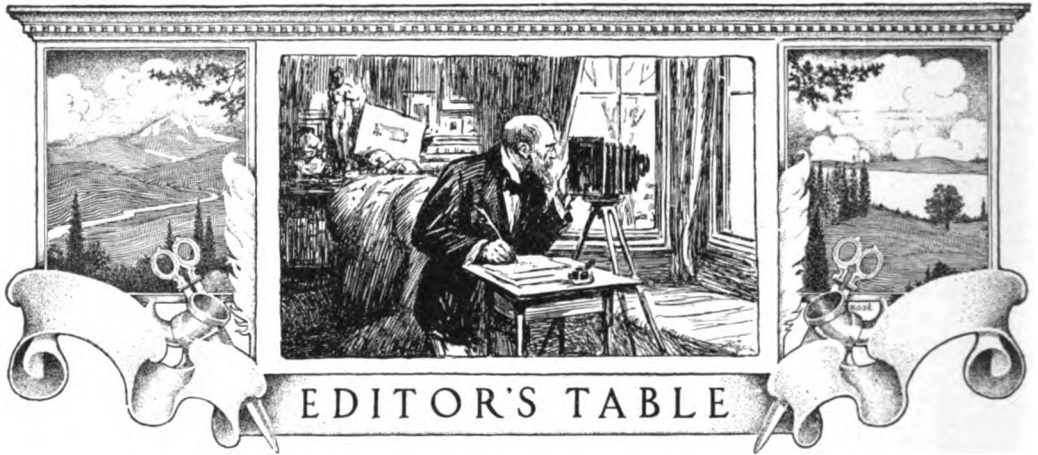
The negative is best carried at the rear end of a box which is fixed to the rear side of the lens-board, the base of the box being made so that the frame which actually holds the negative has an amount of movement of, say, one and a half inches. This calls for a little handiness in making, and if that is not available, the best thing is to get an old pattern quarter-plate camera of the rear-focussing type and fix it by means of a couple of brackets to the lens-board. By means of the winch focussing screw with which these cameras are usually fitted it is an easy matter to provide for the smooth small movement of the negative as required for the different degrees of enlargement. If the focusing is to be done each time, the paper requires to be carried in a separate holder, but the better plan is to provide the box or camera which carries the negative with a scale which

can be marked once and for all, and then to use the apparatus exactly like one of the fixed focus type, after having placed the lens-board in the proper pair of grooves and adjusted the position of the negative to correspond with the degree of enlargement which is required.

Apparatus of this kind is necessarily bulky as regards both girth and length and no doubt this is the reason why it is one which has never been taken up in a commercial way, despite its many advantages in practice. A size to take 12 x 10 paper is, I think, as large as will usually be necessary. A length, then, of rather more than thirty-two inches allows of a 12 x 10 enlargement from a 3 $\frac{1}{2}$ x 2 $\frac{1}{2}$ negative (4 times enlargement) or one of the same size from a quarter-plate negative (3-times enlargement). It equally serves for the making of smaller enlargements from these two sizes of negatives on paper ranging from half-plate to 10 x 8.

Artificial Light

I have spoken of artificial light, and without question such is of essential importance in commercial enlarging work—with these box enlargers or anything else. With a box enlarger the ideal source of light is one which is diffused as completely as possible, *e. g.*, a pair of short mercury tubes or an arc used behind flash opal—in either case, of course, without a condenser. This form of illumination rules out at the start all troubles in the way of dark patches on the enlargement as the result of faulty adjustment of the light when the latter is used in conjunction with a condenser. Whatever one's facilities are in the way of such diffused light, it is an easy matter to adapt it for use with the box enlarger by providing for the box a base which will bring the negative into alignment with, and at the correct distance from, the light. —*British Journal of Photography.*



NEW BUSINESS AND HOW

THERE are few professional photographers, even in these stirring times, who are so happily situated that they do not have to concern themselves about new business. And yet to how many photographers does the admonition, "Get after new business!" mean anything?

Of course we are all going to do it, but somehow we never seem to get to the point of making a beginning. The need of new business is so imperative that we sit around and emphatically protest that the next thing we are going to do is to get after some new business. It is always the next thing in line.

Now the summer months are over, the fall and winter activities confront us and every-day life resumes its usual course. People these times are more or less inclined to think about having their pictures taken. But out of a hundred who *think* about it, perhaps five per cent. will go to a studio of their own volition. How to persuade the other ninety-five to come to your studio is the problem that faces the photographer. With the rapidly increasing cost of living, the high price of materials and the scarcity of help, the problem is becoming more difficult and the photographer himself must become more resourceful.

You must find some method or methods that will make more people decide that they need more photographs

and that *you* are the man to make them. If you are thoroughly wide-awake and up-to-date, you have some new ideas of your own. Put these into effect at once and let your clients know about them. Some of these clients you will hear from, but to secure *new* clients you must advertise. And *you must take every possible means of keeping your name and your work before the public.* Let the people of your town and community know who you are, where you are, and what you are prepared to do for them.

The first and one of the best methods of attracting attention to yourself and your work is the show-case. Almost any picture will attract attention, but the better the picture the greater the attention it will attract. A neat, clean show-case, with a well-arranged display of your best and most attractive work, *frequently changed*, is a strong magnet for new business. Go out and have a look at your show-case and see if you cannot make it more attractive. *Study it.*

For the people who are not within range of your show-case you must advertise. Either by using newspaper space or individual circular matter you must let them know where you are and what you can do. A carefully worded, dignified advertisement in the papers, or the same thing in the form of a well-printed and tasteful circular, will create a desire for your work. Then the finer the work itself, the greater the results.

As to *your* studio—the approach and the reception-room. Have you ever stopped to think of the all-important part *appearances* play in modern up-to-date business? What is known as the psychology of business. When a new bank building goes up in your town notice the heavy columns in front. These suggest and convey soundness, solidity. Or notice the office outfit of an up-to-date business house—the mahogany desks—the rugs, etc., all assuming and at least suggesting prosperity. Or even come to the personal equation. If a man *appears* well dressed we say or *think* he is prosperous; and if, on the other hand, we find him ill groomed and shabby we conclude at once that affairs are going poorly with him. Now apply this principle to the studio. If possible your studio should be on the ground floor. If this cannot be managed, do all you can to have the *approach*—the stairway to your studio clean and *attractive*. Rip up the old, worn, musty carpet or oilcloth and have something bright and worth while. It will necessitate a small outlay but *it will pay*.

As to the studio reception-room—this should be as bright and sunny as possible. The wall paper in some plain neutral tint with a few framed prints, and furniture comfortable and inviting. When possible a vase of *fresh* flowers. Many studios with the old imitation palms and plants, often dusty and dingy, give one the feeling of attending a Chinese funeral. This won't do if *you* want to *attract*. The up-to-date method which the successful photographer adopts is to *simplify*—do away with the old jim-cracks and have a reception-room to *receive*! We know of one Fifth Avenue photographer who repapers and changes the appearance of his reception-room regularly once a year—so it always looks fresh and new to the client.

While these are essential details, there are a hundred and one other ways of getting after new business that can be adopted to *your* particular needs and requirements. The thing is to wake up, get busy and do something now.

THINGS TO STRIVE FOR

WE are living in an age of art feeling, and no matter how great the mechanical skill, there must be something beside it to make a lasting impression. There was a time when the photographer and his customers were satisfied with a picture which was merely a map of the human face. That day has long gone by, for not only is the up-to-date photographer educating himself to a higher standard, but the people who come to him are rapidly learning as well the value of light and shade, of tone and color qualities. They are no longer pleased with a face as white as the collar and cuffs they wear, for they realize that there is a difference in nature, and, if this difference exists in nature, then surely it ought to be in evidence in that thing which is a counterpart, or should be, of nature.

We are creating higher ideals; we are studying the work of others; *getting out of the ruts of our own rut-work and seeking the things that are known to be the best in the work of others*. In other words, we are teaching ourselves to see, and when once we see we will not be content until we produce the ideal in our mind's eye.

Now we know that all subjects are not good subjects. We know that the men or women who so charm us by their manner, their conversation, and by the light and shade of conflicting emotions that pass over their faces while they talk are presenting to us phases of character which it is almost impossible to catch; but to each one there is that something which is eminently characteristic of themselves that we can catch, that can be portrayed on the sensitive plate and kept for future generations. Mind you, we do not forget the dollars and cents side of the business, which must always be uppermost in order that we may succeed. But among your customers there is always some one who will draw forth your admiration, and in whom you will recognize a subject which, if properly handled, will stamp you and your work as first-class. This is your opportunity, and you should not let it pass.

First of all, we believe that a man should be in love with his work; not in the sense that he will be blinded to the good qualities of the work of others, but really and truly in love with the profession which he has chosen, and filled with an ambition to be the best there is in that profession. It is only that kind of a feeling that will bring out the best that is in the man. Under these circumstances his faculties will always be alert, and the hours spent in the study of anything that aids him in his work will be among the most pleasant enjoyments of his life.

Above all things, *study simplicity*; try to see how little it takes to make a picture rather than how much. A portrait requires but little besides the person, and that little should never intrude. Most of the backgrounds are too fussy, too much broken up, and often too much in focus. Let your whole interest center around the face and figure of your sitter, and by all means strive to keep the picture within the plate. If time will permit, talk to or entertain your patrons, at least long enough to see some peculiarity of their manner, some grace of motion which you can make use of. This will give originality to your work and call forth the highest praise; in fact, it will be like them.

Then, too, we would suggest that every photographer study all pictures that come under his notice, particularly if they are good ones. Not only do we

mean photos, but engravings and paintings. Notice how the people are grouped, the accessories, light and shade, and, above all, study nature, never forgetting that you cannot represent nature, but you can approach her in a manner so like her own that people admire and applaud the close resemblance.

Study the papers and other materials you use. Do not become wedded to any one, but always bear in mind that each has its good qualities, and will, under certain conditions, be the best for you to use. Artists seldom work under the same conditions. You will sometimes see them use a coarse-grained canvas, another time smooth; sometimes they paint with the most dainty touch, again with broad sweeps and dashes. It is that they may secure certain effects which can be attained in no other way. *Find new ways to trim and mount your pictures.* Always remember to keep in harmony and good taste. Every period of life has its characteristics, and these should be sought out as expressed in the personality of the sitter, and delineated with discrimination. Bold facts are rarely pleasing. But *there is always something in every face which will please and attract if we can draw it out in our portraiture.* Strive in all you do to hold the mirror, as it were, up to nature.

Thus will photography join hands with her sister arts, and if we all do the best that is within us we will call forth the praise of all men.





PRACTICAL PAPERS ON STUDIO WORK AND METHODS

The Photographer

YOUR town and my town is proud of every mark of culture that it can boast of. Look at the small towns which you may visit, and the first thing they point out to you with pride is the Carnegie Library or some other public building or some store that is a little better than the ordinary.

Now your town and mine is composed of "just people," ordinary people, each one with a certain amount of pride, more or less, for his city or town. You visit any town and you find your friend will take you around and show you with pride, paved streets, monuments, parks, bank buildings, etc., and every person in their town is interested in art in some form or another.

It has been a custom for many years for the photographer to call himself an artist, and we think he is right. The photographer has filled this place in the hearts and minds of all the people for many years.

Photographs are found in the homes of the rich and the poor, in the homes of the educated and the uneducated. There is always a demand for photographs. This demand can be increased to a large extent if properly looked after.

There are two towns which we know of now, where the photograph gallery occupies such a prominent place that when you visit these towns as a stranger and any one points out the different places of interest, they will call your attention to the photograph gallery as being one of the best, not only in the city, but in the country, and they take as much pride in introducing you to the photographer as they would to the mayor.

In one town the photograph gallery is in a small cottage house, but the appearance of the same, the neatness with which the yard is cared for, flower beds, etc., attract the attention of everyone passing by.

There is a right way and a wrong way to handle photographs. Possibly there was a time when any old place was satisfactory for a studio; it is different now. It must be one of the best places in the city or town. It makes no difference

what the price of the photograph, those who have them taken delight in going into a nice place to have the work done. If the place gives the customer confidence, the photographer can secure larger orders.

What class of people does the ordinary photographer sell to. Every class, just exactly the same as the dry goods or drug stores.

Take a small city where there are two druggists and one puts in a new front and fixes up the store, the business goes to him immediately. The other one gets wise and he immediately goes his competitor one better so as to swing the business his way.

Have your place of business so located, so arranged and so fitted up that everyone in your town will speak of it with pride, and you will get an increased business which will more than pay for all the additional expense.—*Ohio Photo News*.

Know Your Customers

You will increase your own personality and your business if you will endeavor to know your customers better. In many studios a customer comes in, selects the picture desired, in due time the work is finished to their entire satisfaction, they pay for the same, and go out. You do not know the customers, except by the name on the negative, or on your books. This is entirely wrong.

You should know your customers well enough so that the next time you meet them on the street or anywhere else, you can call them by name. If they do not recognize you, they will soon ask you, and you can tell them who you are.

Some fifteen years ago, we were talking this to a photographer, who then had a studio in Cleveland, but is now located somewhere in the West. His excuse was that if the customers recognized him or he recognized the customers after they left the studio, they were always finding fault with the work delivered.

No money is made on the customer who goes into your studio or store but once. It is the repeat customer who helps to advertise your

business. He gives you all the photographic work of the family, on which you make profits.

Know your customers; know where they live; know their business, so that when you meet them you can talk on subjects which are interesting to them. Know them so well that they will think of you as their photographer, as they think of someone else as their dealer.

As we grow older in years, most of us, when we wish to purchase anything, go to some store where we have traded, and usually to some particular man in that store. We know him, and he knows us. When we go in, he can call us by name. If it is a charge account, he does not have to ask the residence, but simply says O.K., and you go out, and the goods are quickly delivered.

You go to him because you know him, and he knows you.

An expert in the reception room, who has made a study of it, will be able to call a customer by name when they come in to look at the proofs, nine times out of ten; occasionally they may miss it.

All of us like to be recognized. Oftentimes parties speak to us whom we cannot place; that is our fault, not theirs. When we speak to them and they cannot place us, that may be our fault also, because we have not impressed ourselves upon their mind to the extent that they recognize us anywhere at any time.

Nothing will help you to advertise your business more than to know your customers better.—*Ohio Photo News.*

Advertising Notes

"I've no call to advertise," say a great many photographers. "It's too shoppy," say others. And yet a third body say, "It doesn't really pay or do any good." And, from their point of view, they are right and it doesn't, because they are usually the people who don't take any trouble over it, or give it any thought, but just leave it to a small jobbing printer, who is by no means an expert.

Some of the big firms spend many thousands a year on advertising, and it pays them well to do so, but there is also expert thought and study put into it.

Most photographers might advertise with profit—barring, perhaps, a very small section of exceedingly high-class photographers, whose advertising must be done by other methods, and particularly in scattered districts and crowded centres.

At present, for instance, there is a large quantity of copying and enlarging to be done, also making miniatures, and so on. Often it is possible to suggest to people that they want or would like these things by means of advertisements. Particularly is this so in quiet country districts, which are a very fruitful field for photographic advertising.

But care must be used in preparing and sending such advertisements. It's no use to send circulars saying that you want to make them such things. First, you have to make these people realize that they want or need them, and usually photographers, in drawing up adver-

tisements, begin at the wrong end of the stick. Either they say, "I can" or "We can" do so-and-so, instead of saying, "Wouldn't you like to see a nice enlargement of your soldier son on the wall?" Or, "You keep intending to send in that old photograph," and so on. Don't talk about yourself, but the client. Interest him or her in himself or herself and what he or she would like, and you've made a good beginning.

Most photographers could write a good, chatty, interesting letter to a friend, yet they pay for and send out starchy, formal, and antediluvian advertisements, that are immediately screwed up into a little ball and tossed in the grate. You all know the sort of thing I mean—on cheap, common paper, bad type, and obviously an advertisement.

That's all wrong. Your advertisement must first of all make an impression on the eye the minute it's opened, so that it will not be tossed aside, but by its attractive appearance compel examination. That's the first point gained. Then it must be so crisply, interestingly, and personally worded that it sets the reader thinking, and starts his mind off on a train of thought. That's the second point. Then your own share in the matter should be so presented that you make the recipient feel that you're just the man for him, and he'll call on you with his original, or whatever it is. That's point No. 3. Then, too, it's possible so to arrange matters that, by posting at the proper time, it will reach him or her at the most likely moment, say, by Sunday morning's post, when there's time to read in comfort, or Wednesday or Saturday afternoon. The ordinary morning delivery is not always the most desirable, when folk may be cold, hungry, or in a hurry, and the advertising matter gets put aside unread.

Make your advertisement as interesting as possible by using short, crisp, simple sentences, in a chatty, personal style, as though there really is a man behind it, and put in any little matters of interest that occur to you. The rise in the price of plates, the scarcity of certain chemicals, and many other things, may be made to tell, even with amateurs—who always like to feel wise, and be talked to accordingly—and often by this means you can make them feel that, after all, it's better and cheaper to send their pet negatives or prints to you to be enlarged or copied than to mess about themselves.

Make your advertising a practical help to you. For instance, now (the days of early autumn) is a good time to remind folk of when they must post to relatives overseas so that their gifts will be in good time for Christmas, and still give you time to execute the orders properly without undue rush and haste. This, especially just now under present labor difficulties, may greatly help to ease down the fatal Christmas "rush."

Then a few weeks later, a gentle reminder about the photographs they will want for Christmas, and a human personal touch in it, as to the length of time you like to give an order to get it nicely done, and the difficulties they cause—especially now—by "putting it off," may bear much good fruit and speed things up con-

siderably. It's quite worth doing. It gives better time to finish work, and you can do better work when not rushed.

Always choose nice clear type, not too small and not too black, (or it will dazzle the eyes), that will be easy to read, and nice "good"-looking paper, a neat and tasteful design, that will speak well for the quality of your studio output.

Illustrations are sometimes good, though not by any means essential; but then you must choose paper suitable to your block, and see that the block is a good one and does you justice. Very cheap blocks are vile things—coarse and inartistic as a rule, and most unsuitable to a photographer's purpose.

I have only touched on a few points, but just think them over quietly, and I know you will readily see the truth of them, and other things also will occur to you.

The secret of the whole matter is to give more study and careful thought to the advertising you send out in the same way you would to your window display.—G. E. H. G., in *British Journal of Photography*.

System and Failure

FROM all directions are coming warnings that the business men of this country should get in line with the system and business science that European countries have found necessary, for the time will come very soon when we will have to hustle if we would maintain our high scale of living and yet compete with Europe in trade. It is all so very sensible and sound that we can not but sanction and applaud the movement and use our means to apply it to our trade and our readers, so that they may have as much benefit from it as other business men.

"Why Do Men Fail in Business?" seems to be the title most commonly used, although the title is of small moment. It is the argument that counts. The problem that it is attempting to solve is how the percentage of failures in business may be reduced and how competition can be conducted on broader and fairer lines. The government has taken an interest in it, and Edwin Hurley, chairman of the Federal Trade Commission, has published a pamphlet entitled: "A System of Accounts for Retail Merchants," and in it he makes the following statements:

"1. That the majority of retail merchants do not accurately know the cost of conducting their business.

"2. That there must be decided improvement in this direction before competition can be placed upon a sound basis and before we can expect a decrease in the heavy business death-rate among retail merchants."

Photographers have rarely taken premiums for business ability, and those who are familiar with the elements that contribute to success in photography do not wonder that this is so. But without interfering one whit with true artistic ability, we believe most confidently that they are able to and will in time conform to the business systems that are worked out for other lines of trade. The first requisite for the understanding of one's own business is an

accurate knowledge of the cost of doing business. We cannot and do not propose to go into a discussion of this, but earnestly advise all photographers who want to keep far away from the liability to failure, to study the question and, by broad reading, to learn how to do it.

The methods of finding out the cost are fundamentally the same in all lines, and vary only with the character of the particular line to be worked out. Cost of material, labor, overhead, etc. One photographer that we know started to look into it. He found it rather more complicated than he expected, but it became so thrilling and interesting that he followed it out more thoroughly than we have yet heard of it being done in our trade. He kept an accurate tally-sheet of the material, time of use of equipment, time of developing, handling, printing and delivering, with salary costs and waste. He was astounded to find that when he went out to make an 8 x 10 negative and from it finished two or three prints that the actual cost of that job was between three and five dollars. He had been charging a flat rate of one dollar for making the negative and thirty-five cents each for prints. He was losing from one to three dollars on every job of that kind. By further investigations of costs he found where he could make a proper percentage by advancing here and reducing there. The worst of his troubles, when he put his new ideas into force, was the protest of his competitors who could see only the reductions in his prices but not the advances. They thought it a reduction instead of a readjustment. Customers got a shock when they were charged from two to four times the former price for negatives, but less for the prints, until it was explained, then they got busy and figured out how they could take advantage of quantities and cost reductions by having more negatives made at one time and more prints, and to their surprise, they found that they, too, could save money by a little planning. If an emergency demands that the photographer be required to go out to make one plate, he now goes and the charge is based on the time consumed and other cost items, and whether it is three dollars or five dollars it goes.

Photographers have long underestimated their costs. They have figured on the cost of materials, and their prices showed a profit of two to four hundred per cent. And yet they could not make any money at that percentage of profit. Marvellous, you might say. It is. Marvellous that so many do not realize that the cost of their materials is a very small percentage of the cost of photographs. The materials are a part, but other items run up the costs that the actual facts are that the cost of production oftentimes runs more than the receipts. It is marvellous that a paradox like this: "I make four hundred per cent. profit, yet I am losing money" has been accepted, swallowed, bait, hook and line, without question. And add to that the ticket schemer or advertising promoter can prove to a photographer that it is possible for him to give his work away and yet make money and pay his bills. Every year a certain number of photographers fall for this argument and accept this fallacy.

The public is becoming very wise, indeed. It is a shrewd and foxy public that slips in and grabs all the free pictures and does not permit itself to get caught by the reorder trap so clumsily laid for it. The customer probably knows more about the cost of doing business than the photographer, and it is not its concern if they are given an opportunity to get something for nothing and then accept it. The photographer cannot comprehend why the public does not fall into the trap, which is a fair sample of that type of blindness in this country. To enable the business man to see where, how and when he is losing money is the mission of the writers and investigators of cost systems.

If a business man understands his costs he will not sell goods at a loss. If he does not sell at a loss he will make a living. If he makes a living he will be more contented and cheerful. If he is contented he will not worry over his competitor. He will sell his goods to make a profit, not to prevent his competitor from getting a sale.

Mr. Aesop, of ancient Greece, must have been acquainted with many photographers who worked the ticket scheme, for he wrote a story about a lion and wolf who fought for a piece of meat. They bit and tore at each other until they were exhausted, when a fox came along and ate the meat while they lay there and watched him, too weak to prevent.

After the war every man has got to make his business go and go right. In order to do this he must have some system and know the foundation principles of business. We do not want any one to fail in business, but sometimes it is by the failures that we learn our most valuable lessons, and, of course, experience is the best teacher, but she keeps a very high-priced school. How much better it would be if we could get that experience by other means, and how welcome should be the news that there is available for every man who wants to learn how to make his business pay, accurate and carefully prepared instructions for so doing. You may have to walk to a bookstore to get that information, or you may have to do a little serious work, but that is not such a terrifying price to pay for success.—*Trade News*.

Studio Lighting

THE size of the studio is an important factor in any scheme of lighting. The smaller the studio the more difficult it is to get soft, even effects in any sort of variety. Many studios are not more than twelve feet wide, and some even less than this, giving little space for moving the sitter, camera, or backgrounds, and leaving all the work to be done by the blinds. In such cases, as the light must necessarily come mainly from one side, it is desirable to have a fairly long light both at top and side, so that by manipulation of the blinds the main source of light may be placed at varying distances from the sitter and background. There is a great temptation when working in a small studio to rely too much upon the use of a reflector, but the beginner is cautioned against making too much use of this useful adjunct to lighting; he should endeavor

to get satisfactory illumination without its aid. It is so easy to make a passable result from a badly lighted model by softening the shadows by reflected light that there is a great temptation to do so, but a picture so lighted will never have the plasticity that is found in one in which the effect has been mainly obtained by direct light. Some portraits otherwise good suffer from an overdose of reflected light and give the impression of a waxen figure lighted from the interior. The object of using a long top light in a small studio is to enable a fair amount of front light to be used so as to secure a general illumination of the face or figure, the necessary relief being given by a comparatively small side light, higher or lower, as the features of the sitter may necessitate. As a general rule there is a tendency to have the top light too much opened over the sitter's head. This results in sunken eyes and deep shadows under the cheek bones. This remark is particularly applicable to studios which are lighted from the top alone. These should have plenty of light in front of the sitter with a fair amount of opaque blind over his head. In such studios an approximation to a side light may be obtained by hanging a waxed paper or tracing cloth blind from the roof to catch and divert some of the light; by this means a distinct improvement may be obtained, especially in the lower part of the figure.

In wider studios much greater freedom of action is possible, and many and varied lightings obtained by changing the position of the sitter without touching the blinds. An ideal studio would be one perfectly square with a high side light, and for the sake of groups a top light extending at least one-third across. In such a room every class of work could be successfully attempted, one specially useful style being the "miniature painters' light" for delicate vignettes and particularly for portraits for coloring. This is a top front light almost strong enough to cast a shadow from the nose, just curtained off enough on one side to give roundness without hard shadows. On such a picture the coloring will have its full value without the hardness and heaviness frequently seen when the ordinary "three-quarter light" is used.

It is of little use to give formula for lighting for the aspect of the studio; its internal coloring and the outside conditions all exercise such influence upon the light that what in one studio would produce a hard effect would in another produce a flat one. Even the nature of the glass will make an important difference. In one case the removal of rolled glass and the substitution of clear plate totally upset the work of a very experienced man for a week or two, until he mastered the new conditions. It is obvious that no set arrangement of blinds, to suit both kinds of glass, could have been devised, to give even passable results.

One important point which must not be lost sight of is the effect of the distance of the blinds from the sitter. Distant blinds mean soft lighting without much distinctive character about it; hence in large and particularly lofty studios it is advisable to have a set of blinds fixed upon a movable stand. These practically constitute a studio within a studio, and enable

the operator to secure a boldness and breadth in his work which would be unattainable if using blinds twelve or fifteen feet away from the sitter. One advantage of this arrangement is that it can be used much in the same way as an electric light umbrella—that is to say, it can be pulled to and fro until the beam of light through the opening in the blinds gives the desired result. Radical changes in lighting can be effected in a quarter the time and with a quarter the exertion required if the ordinary blinds have to be altered. The ordinary circular head screen is a very useful adjunct, especially in small studios. It may be used when the lighting is fairly good, but the bald pate a little too shiny, or when the cheeks are a trifle hollow. It may be covered with lawn or the thinnest nun's veiling; calico or nainsook stop too much light. A perfectly opaque head screen of the same pattern is often useful for subduing a glaring patch of drapery. A dark complexion and a white blouse form a trying combination, but a harmonious negative is easily obtained by placing the little black screen just where it will cast a shadow on the obtrusive garment, and so obviate its excessive density in the negative.

At one time ground glass was frequently used for glazing studios, but it has now fallen into disuse. It has the effect of softening the light, but it slows it to an alarming extent. It is better in the case of studios with a southern or eastern aspect to diffuse the light by means of tightly stretched blinds of thin nainsook or jaconet, which can be easily washed, and removed altogether in winter.—*British Journal of Photography*.

Service

A FEW years ago there were very few automobiles owned by photographers. Today the photographer, especially the home-portrait photographer, finds an automobile almost a necessity. If an automobile is necessary to get to the home of a customer it can be made equally useful in getting the customer to the studio.

Children are often tired out by the time they reach the studio, and this is an argument used by the home-portrait man to good advantage. If you do not do home-portrait work, and are fortunate enough to own an automobile, why not use it to as good advantage as possible in getting business into the studio.

Every child likes a ride, and every mother who does not have a car at her command will appreciate being relieved of the fuss and worry of getting the youngsters to the studio. You may not realize how much of an inducement this can be made. Think it over carefully and try it out a few times as an experiment. You will most likely keep it up. The news will spread, and this bit of service will make your studio a place the children will want to visit. And with the trouble of getting them there removed the mother will more likely have photographs of them more often than otherwise.

This may not seem worth while to the owner of a car, and sometimes it may be a service that will be inconvenient to render. But that's just what service means. Going a little out of your way to please a customer is service—doing the little more than is expected of you is service—and doing a thing cheerfully and ungrudgingly whether it brings you an immediate order or not is service.

If you can't go a bit out of your way to get business you can't expect others to go out of their way to give you business. But show a willingness to give real service, and it doesn't matter much where you are the business will go out of its way to come to you.—*Photo Digest*.

Odd Jobs

It is not a simple matter to make good photographs in a glass house where the light cannot be controlled. That is why many professionals do not specially welcome orders to photograph interiors of greenhouses and conservatories. The chief difficulty is to avoid halation. Nothing will help the photographer so much as Eastman portrait film. Its non-halation qualities will save the detail in the highest lights, and if used with a K2 filter its orthochromatic qualities will insure getting detail in the foliage.

Apart from taking general views of greenhouses and conservatories there are many orders at this time of year for photographing good specimens of flowering plants and well-cultivated vegetables. A gardener or the owner of a small private greenhouse and garden will often want a few pictures of extra-fine specimens. It helps wonderfully when a photographer lets such customers know that he is capable of doing good panchromatic photography.

Some people have an idea that a good color filter is one that doesn't require a great increase in the time necessary to get a fully exposed plate. The very opposite, however, is true if proper color correction is desired. If a blue object and a yellow object are of the same tone and are to be photographed so they will appear the same tone, and if the plate is ten times as sensitive to blue as to yellow, then nine-tenths of the blue light must be cut out by any filter that will make the two colors photograph in approximately the same tone. The exposure with such a filter would be nine times as great as the exposure without the filter. A filter requiring less exposure would give less correction but could not be considered a better filter.—*Photo Digest*.

Advice

TAKE 10 per cent. of your time for yourself. You are robbing your business if you don't.

GOOD business principles backed by quality spell success in photography.

THE best way to eliminate resittings is to express a readiness to make them.



Is This the Solution of the Portable Motion-Picture Projector Problem?

ALMOST from the dawn of motion pictures down to the present day an effort has constantly been made to perfect a projection machine so small, compact and light that it could be taken anywhere and operated by an amateur. One after another so-called "home projectors" have been devised and offered for sale, but each has usually lacked some important requisite when actually put to use, and the problem has been tackled anew.

The latest device is a portable motion-picture projector which anyone can operate and under rigid tests it appears to have come nearer the requirements than most of the others thus far. The new projector as described in *The Scientific American* is light—weighing but twenty-one pounds; compact—folding up to a size not larger than a small suitcase; uses an ordinary electric light socket as its means of securing current—the light being produced by a specially-made nitrogen bulb which casts a light as brilliant as that secured from the ordinary professional projector; the film can be started or stopped at any point and held stationary on the screen without danger of fire; the film can be turned backward at any time, if so desired, and there are numerous other features which will appeal to those seeking portable projection machines for the showing of industrial or commercial films.

One of the oldest film manufacturing concerns is the originator of the new projector. Having been so long connected with the film industry, it was not difficult for this concern to avoid the mistakes made by previous experimenters with portable projection machines. A case in point is the brilliancy of the light, which has been a surprise to many projection experts. A picture equally sharp and clear is thrown on a screen eight feet wide or on a piece of carboard only eight inches wide, as best suits the requirements of the user. Standard size films are used, and rolls or spools holding a thousand feet can be easily handled side by side. This feature enables the firm already possessing several reels of commercial film to show the subject whenever and wherever it likes. If desired for any reason to lecture with the film as it runs through the

machine the new projector can be stopped at any point on the film in order to project a single view as with the ordinary stereopticon. In transporting the projector the lens, crank and legs are placed inside the case.

The application of motion pictures to commercial life has been discussed many times in these columns; but the peculiar circumstances attending the present European war and its aftermath again bring this subject to the front. Indefinite uses will probably be found for the ideal portable projector, no matter which one it may be, in selling goods abroad in post-bellum days. American salesmen who will invade Europe to sell goods of all sorts will not use samples or models of their goods, especially if they are selling machinery and building supplies and the like. Instead, they will display motion pictures of the huge American factories actually at work turning out the goods, showing every detail of manufacture, and ending with a pictorial demonstration of the goods actually in use by the ultimate consumer. It means the elimination of small working models of locomotives, huge tractors and ponderous machinery of every kind from the salesman's equipment.

Cutting Prices

WE have talked with a number of photographers who have the idea that on account of the fact that they had all of the necessary equipment and facilities for turning out amateur finishing and enough spare time to do it without interfering with the regular studio work, that it was possible for them to do amateur finishing at cut prices and still make a profit. They argue that it is extra business which is entirely separate and distinct from the studio business, that all they make out of it is clear profit above the cost of paper, chemicals and time, that the calculations of these costs show 100 per cent. profit on amateur finishing, and that they are making big money.

We are heartily sick of the argument that photography shows a margin of profit of from 100 to 300 per cent., especially when we face the actual fact that every photographer who argues on that basis is almost always short of money and discontented with the prospects of the photographic business. If the photographer

was making 100 per cent. profit, he would always have a pocket full of money, and if the argument was sound he could not lose money.

The fact of the whole matter is that every business man who argues to himself in this manner is deceiving himself. He is bolstering up his hopes with a false argument, and the very fact that he is not making any money when his figures show that he is making a 100 per cent. profit should convince him without argument that there is a fallacy somewhere in his calculation.

The error lies in the fact that he is deceiving himself as to the cost of his product, because he does not make each job or each portion of his business carry its proper proportion of the overhead expenses. If he would make a correct calculation of his expenses of doing business, he would discover that, instead of making 100 per cent. profit net, he is very fortunate if he can make 10 per cent. net profit.

This is the reason why so many photographers will cut prices, not only on regular work, but on amateur finishing. Many photographers have had the experience of catering to the amateur finishing trade by proving to themselves that it yielded a big margin of profit, but have later become disgusted with it and given it up when the results proved to them that they were not making any money from it.

It is our opinion that amateur finishing is a very valuable portion of the trade of any studio, and if it is done at a proper price and given sufficient attention and care to make the work worth the price charged for it, it will add materially to the volume of business, and just as positively to the profits of the studio.

The argument that a photographer who mixes up a batch of developer for his regular studio work is able to develop films free because he is put to no extra expense and because the little time devoted to it is more than paid for by the 100 per cent. profit on making prints, is lying to himself.

We have used the strongest word in the language. Every red-blooded American will resent the charge that he is lying, and we hold that this characteristic trait is a strong and pure Americanism. We urge our readers to study their cost of production and to prove to themselves that they have been lying to themselves.

Many have deceived themselves through ignorance. Many have been convinced to this line of argument by some ticket seller or agent who had his own ax to grind. Many have deceived themselves deliberately. But, call it what you will, or excuse it as you will, the fact remains that when once the photographer becomes convinced that he is not making a profit when his figures indicate that he is making 100 per cent. profit, then he is lying to himself somewhere, and it is high time that he discover how it happened. If another man should call him a liar he would knock him down. If he can prove it on himself, he should show just as much energy in resenting it. These are strenuous times, and it requires very great care in figuring costs and expenses. The man who advances prices should fully understand why he is doing it, for if he can justify himself in the eyes of his trade and

convince his customers that he is warranted in the advance, he can be successful.

If he does not know why he is charging more, he cannot convince his customers, and they get the idea that they are being cheated or imposed upon, and naturally will resent it. Every advance in price should have a sound reason behind it to succeed, but we can assure the photographers that they have many and sufficient reasons for advancing many of their prices.

The expense of producing pictures does not stop with the cost of material, or even with the overhead of the studio. It extends to increased costs in all of the many articles that are necessary for keeping up the appearance of the studio, and for making replacements. Also his personal expenses have increased, and he requires more for his own support.

These increases make it very necessary that the photographer should improve his margin of profit, but they may not all be arguments that he can present to his customers, so care should be exercised in determining those arguments that will prove convincing to the public and those that make the advance necessary, but in which the public is not concerned.

We earnestly commend these statements to our readers with the hope that they may be given careful consideration. Each individual must work out his own business success, for in this country we have no paternalism. No kind friend is going to compel the business man to make a living. Unless the business man practices extortion, the government gives him a free hand, and permits him to work out his own destiny. Therefore, your success in business is up to you, Mr. Photographer!—*Trade News*.

Enlist Your Lens in the Army

PEOPLE of the United States are asked to help the Signal Corps of the Army get lenses enough for cameras for the fleet of observation airplanes now being built. The need is immediate and of great importance; the airplanes are the eyes of the army and camera lenses are the pupils of those eyes.

German lenses can no longer be bought in the open market. England met this difficulty, in the earlier stages of the war, by requiring lens-owners to register lenses and requisitioning those needed. England is now making lenses better than the German ones formerly imported, but no faster than needed for her own uses. The Bureau of Standards of the United States Department of Commerce is now perfecting a substitute for the German "crown barium" glass used for lenses, and will later be able to meet the needs, and special lenses are being designed for this work.

The situation now, however, is that, with airplanes soon to be ready for service, suitable lenses cannot be bought. Hundreds are needed at once. Possessors of the required types are urged to enlist their lenses in the Army. They are asked to immediately notify the Photographic Division of the Signal Corps, U. S. A., Mills Building Annex, Washington, D. C., of lenses of the following descriptions which they are willing to sell, stating price asked:

Tessar anastigmat lenses, made by Carl Zeiss,

Jena, of a working aperture of F. 3.5 or F. 4.5, from 8½ to 20-inch focal length.

Bausch & Lomb-Zeiss Tessars, F. 4.5., from 8½ to 20-inch focal length.

Voigtlander Heliar anastigmat lenses, F. 4.5, 8½ to 24-inch focal length.

Practically all of the lenses of these types in America will be required, but the 8½ inch lenses are most urgently needed.

12-inch condensers also wanted.

An Exhibition of Pictorial Photography Under the Auspices of the Newark, N. J., Museum Association

AN exhibition of pictorial photography by American artists was held during the month of October at the galleries of the Newark, N. J., Museum Association. The display was a traveling exhibit, collected and arranged by representatives of the organization known as the Pictorial Photographers of America, and it will appear from time to time in other cities of the East and West.

The pictures were all mounted and framed uniformly and in excellent taste, the frames being included, doubtless, for the purpose of protecting the prints in transit.

Publications of the Research Laboratory of the Eastman Kodak Co.

WE have been favored with a copy of the second volume of the *Abridged Scientific Publications from the Research Laboratory of the Eastman Kodak Co.*, which includes abridgements of papers issued from the Laboratory in 1916 and the latter part of 1915. The papers have been previously published in various journals, to which the reader is referred on each case. These abridgments are mainly of a technical character and the new volume is not intended for general distribution. There are twenty-five papers in all, and the authors include Messrs. C. E. Kenneth Mees, the head of the Laboratory, Orin Tugman, A. S. McDaniels, L. Schneider, P. G. Nutting, L. A. Jones, M. B. Hodgson, Kenneth Huse, S. M. Furnald, A. J. Newton, J. I. Crabtree, Adolph H. Nietz, S. E. Shepard, R. B. Wiley, A. B. Clark and Frank E. Ross.

Death of M. Charles Mendel, Editor Photo-Revue

FROM the latest copy of the *Photo-Revue*, we learn with regret of the death of M. Charles Mendel, its founder, in 1888, and editor and manager since that date. M. Mendel published a large number of the leading French works on photography and did much to develop the photographic industry in France. He was very quiet and unassuming in manner, the pattern of courtesy and kindness, and leaves behind many friends to regret his loss. He died, after a long and very painful illness, at the age of sixty.

An Interesting New Catalogue

FROM Jas. H. Smith & Sons Co., of Chicago, Ill., we are in receipt of a new catalogue of their flashlight and other photographic specialties. These include the Victor flash cabinet for studios, Halldorsen home portrait flash lamp, Victor

portable flash-lamp for banquets, etc., the Caywood flash-lamp, Victor and Inglis flash powders, Victor intensifier, Victor opaque, Victor vignetter etc.

A copy of this catalogue will be of interest to every photographer.

An Important Price List of Chemicals

WE bring to the attention of our readers for careful perusal the monthly price list of Charles Cooper & Co., 194 Worth Street, New York City.

The chemicals offered by this old and reliable house are second to none and the prices are named according to the quantity. They would appreciate an opportunity to figure on your requirements.

Photographic Division U. S. Army

UNDER the direction of Secretary of War, Newton D. Baker, the photographic division of the U. S. Army was assigned to the Signal Corps. This division was created August 2 last, and the following personnel of commanding officers named:

Maj. James Barnes, Signal Corps, U. S. R.

Maj. Bert E. Underwood, Signal Corps, U. S. R.

Capt. Charles F. Betz, Signal Corps, U. S. R.

First Lieut. Edward J. Steichen, Signal Corps, U. S. R.

First Lieut. Edwin F. Weigle, Signal Corps, U. S. R.

First Lieut. Albert K. Dawson, Signal Corps, U. S. R.

The Photographic Division will operate under the direction of the General Staff and also in conjunction with the News and Publicity Division of the War Department. No citizen photographer will be allowed to go with the army in the field, and all photographs, therefore, will be distributed through the committee on information at Washington. The division will obtain all necessary photography to form a complete and comprehensive pictorial history of the "War of 1917."

The Federal Photographic Society of America

THE Federal Photographic Society of America held its first meeting of the season of 1917-18 at the New National Museum, Washington, D. C., on October 4, 1917.

Mr. Loring W. Beeson, honorary vice-president of the Society, gave an interesting talk on "Photography of Live Stock," which was greatly appreciated by those who heard it and was freely discussed afterward by all present. Mr. Beeson was voted the thanks of the organization for the information which he so ably presented.

Plans for the Liberty Loan advertising campaign were discussed. (See announcement on another page of this issue.)

Mr. Carl L. Oswald was given a vote of thanks for his thoughtfulness and patriotism in suggesting such a praiseworthy method of assisting our Government and for his help in getting the suggestion under way.

The next meeting of the Society will be held in the New National Museum on Thursday, November 1, 1917.

ANTHONY LUDWIG, President.

EARNEST L. CRANDALL, Secretary.

Photography as an Aid to Builders

THE camera has become useful to building contractors by its ability to prove the condition of work at a certain date, says the *Scientific American*. When necessary, photographs can be offered in evidence in a court of law, and progressive firms are insisting on the insertion in their contracts of a clause giving them the right to use a camera. An English sub-contractor for the woodwork in a large building recently forfeited a sum of £400 for a delay for which he was in no way responsible, simply because he was not in a position to prove that on a specified date the building had not progressed sufficiently far to enable him to commence his operations. The camera would have proved his case and saved his forfeit.

U. S. Now Assured of Platinum Supply

AN epoch-making chemical discovery that promises to revolutionize the production of platinum and give to the United States Government all of that most valuable and much-needed metal that it can possibly use, has been made by General Russell Thayer, former chief engineer and superintendent of Fairmount Park, Philadelphia.

General Thayer, whose high standing in the community needs no comment, makes the astounding statement that from the platiniferous sands in New York State and other platinum deposits in this country it is possible, by the process he has discovered, to produce commercially and supply the world with all the platinum it can use in the next five years. Platinum just now is worth \$1600 a pound.

The latest reports on the Russian deposits of platinum, from which the world has largely heretofore been supplied, show that they average only $7\frac{1}{2}$ grains of platinum to a ton of sand, whereas General Thayer thinks it will be found—and he says the numerous tests he has made show it to be the case—that the platinum metal-content of the New York sands and other deposits in this country will average from 15 to 40 grains to the ton, which can be extracted commercially by the process he has discovered.

Immense deposits of sand near the Adirondacks conservatively carry values in platinum metals of from \$5 and upward in value per ton, besides, he says, about \$2 in free gold in a finely comminuted state. His process is the key which renders it possible to extract the finely comminuted platinum metals he has found to exist in the form of minute wires and in the colloidal state in those sand deposits. The processes he has developed extract both all the platinum metals and the gold.

He has just tendered the United States the free use, during the war, of his process for the production of platinum, and says he will assist the Government in every way in his power.

The principal use for platinum in connection with high explosives is in the filtering and purification of the concentrated acids that are em-

ployed in the manufacture of these explosives, platinum being the only known metal not susceptible to attack from either sulphuric, hydrochloric or nitric acids in their single state. Platinum will withstand a very high temperature, as it melts at 1775° Centigrade, which is more than 4000° Fahrenheit.

General Thayer is president of the Platinum Metals Company, which controls a large deposit of platinum metals—about 200 acres—with an average depth of at least fifty feet. The volume of platinum-bearing sands in this tract, he says, would aggregate approximately 22,000,000 tons. Taking platinum at its present value and allowing the net recovery to be \$5 per ton, the value in this tract would be worth \$110,000,000. Tests of these sands, he says, prove they will average (taking platinum at its present value of \$100 an ounce) about \$8 in platinum metals to the ton of 2000 pounds. On the tract is a three-story mill, built for the extraction of gold from these sands. The mill is located in the town of Salisbury, Herkimer County, N. Y.

Through Prof. James M. Hill, of the U. S. Geological Survey, General Thayer has offered the Government the property and mill, free of rental, during the continuance of the war. This, he says, taken in connection with the free use of his process, would enable the Government to produce platinum metals in considerable quantities without much delay—the Government installing as soon as possible the necessary machinery and equipment to extract the finely comminuted and colloidal metals which form the great mass of the platinum metals deposit, by means of his process and the amagrite process for extracting the granular platinum and the gold values. The gold values, General Thayer says, will pay cost of extracting the platinum values.

He suggested to Prof. Hill that, if the Government wished to produce its own platinum, it would be wise to make an appropriation of \$100,000 to quickly install the necessary machinery in the mill.

Photographs in Demand

The Art Editor of *The Ladies' Home Journal* sends us the following letter:

"Beginning with an early issue, it is our intention to run each month three pages of photographs which have not been published elsewhere. The photographs selected for these three pages must be of *unusual interest*; in other words, striking, startling or amazing and of such character as to make the reader of the magazine 'sit up and take notice.'

"For instance, such subjects as the largest steam locomotive ever made; a portrait group of one family containing fifty-eight members of which I recently saw a picture in a farm and garden magazine; a group picture of thirty-eight musicians, all world-famed (such a picture, I believe, was recently made at a summer resort); a landscape which would come within the category of the unusual and the amazing, etc.

"We will pay an unusually good price for photographs which have not been published elsewhere and will not be released by you until fifteen days after their appearance in *The Ladies' Home Journal*."

Eastman Co. Dividend

THE directors of the Eastman Kodak Company, of New Jersey, have declared an extra dividend of $7\frac{1}{2}$ per cent. upon the common stock, payable on December 1 to stockholders of record at the close of business on October 31. The usual quarterly dividends of $1\frac{1}{2}$ per cent. upon the outstanding preferred stock, and of $2\frac{1}{2}$ per cent. upon the outstanding common stock, will be paid on January 2, 1918, to stockholders of record at the close of business on November 30.

The Clarence H. White School Moves to New Quarters

THE Clarence H. White School of Photography opens its fourth winter session October 29, 1917, at 122 East Seventeenth Street, New York. The new location is the old Washington Irving House, and is noted for its beautiful architecture, its spacious and well-lighted rooms carefully arranged and equipped to meet the demands of the school.

The course of instruction covers a period of twenty-eight weeks, in lectures and practical work, under carefully selected instructors and lecturers, whose duties are to thoroughly familiarize the student with the construction and use of the various types of cameras and lenses, plates and developers, and all printing mediums of value to the photographer. The student will be given practice in exposure and development; in the use of light in the studio, and in home portraiture; copying, enlarging, and in the application of photography to the many new fields now open to the photographer. One week in the month of May will be spent in the country, where the student will have the opportunity of greater experience in out-of-door exposure, posing the figure in the open, photographing of clouds in landscape, and landscape photography.

Students are familiarized with the fundamental principles underlying the important works of art, through carefully selected lantern slide reproductions of important examples of art and art photography, and are given criticism of exercises in design, executed with pencil and camera, in the cultivation of taste and personality.

Problems are assigned, and criticism of photographs submitted are given weekly.

Many of the students of former years are now among the favorably known exhibitors of this country and Europe, and some are successfully engaged in teaching and practicing the art of photography. The school is continually in receipt of requests for assistants in studios and educational institutions.

A diploma will be awarded to each student completing the prescribed course of study of the school.

Tuition fee for instruction is \$125 for each half year (fourteen weeks) payable in advance.

Special courses have been arranged for students who wish to take up only certain portions of the work.

The school year extends over a period of twenty-eight weeks from November to June with vacation terms at Thanksgiving, Christmas and Easter. Hours of attendance for classes are from 9 to 12 and from 1.30 to 4.30.

Ninth Summer Session of the school will be

held at Canaan, Connecticut, in July and August, 1918.

One month previous to the opening of the school the office at 122 East 17th Street will be open from 9 A.M. to 5 P.M.

For further information address Clarence H. White, 122 East 17th Street, New York City.

· BREVITIES ·

Photographic Subjects in Leading Periodicals

"Focussing in Portraiture," *British Journal of Photography*, 1917, p. 338.

"A Bibliography on Color Photography," *Motion Picture News*, July 21, 1917, pp. 452, 886.

"The Photographic Rendering of Tone," by C. E. K. Mees, *Studio Light*, July, 1917, p. 6.

"Douglas Natural Color Motion Pictures," *Photo Era*, September, 1917, p. 143.

"Restoring and Copying Daguerreotypes," by B. E. Havelock, *British Journal of Photography*, 1917, p. 424.

"Carbon Portraits," *British Journal of Photography*, 1917, p. 393.

"Drying Marks on Negatives," *Kodakery*, September, 1917, p. 14.

"Sketch Portraiture Complete," by J. S. Adamson, *British Journal of Photography*, 1917, pp. 326, 339.

"Foggy Negatives," *Studio Light*, July 1917, p. 16.

"The Parallax Method of Fine Focussing," *British Journal of Photography*, 1917, p. 322.

"The Properties of Contrasty Bromide Papers," *Photo Revue*, June, 1917, p. 3.

"Wild Animal Photography," by H. T. Middleton, *Kodakery*, August, 1917, p. 8.

"Some Trials of Kallitype," by C. N. Bennett, *British Journal of Photography*, 1917, p. 378.

"A New Departure Screen," *Motion Picture News*, July 21, 1917, p. 446.

"Qualitative Tests for the Commoner Developers," by W. Ermen, *British Journal of Photography*, 1917, p. 390.

"Technical Requirements for Profitable Photo-Engraving," by A. J. Newton, *Photo Engravers' Bulletin*, July, 1917, p. 43.

"Standardization," *Motion Picture News*, September, 1917, p. 1875.

"Halation," by C. E. K. Mees, *Kodakery*, September, 1917, p. 18.

"Sepia Toning," by C. L. Gregory, *Moving Picture World*, September, 1917, p. 1854.

"A Method of Test Shutter Speeds," by R. V. Wilson, *Photo Era*, 1917, p. 114.

"Light Filters and Large Apertures," *British Journal of Photography*, 1917, p. 410.

"Enlarged Negatives and Transparencies," *Photo Miniature*, August, 1917.

"Covering Power and Definition," *British Journal of Photography*, 1917, p. 411.

"Fixing Baths," *Moving Picture World*, September, 1917, pp. 1542, 1698.

"Remedying an Overdeveloped Negative," by A. E. Thomas, *British Journal of Photography*, 1917, p. 442.

"Drying Negatives," *Kodakery*, September, 1917, p. 22.



THE WORKROOM

By the Head Operator



PREPARING YOUR OWN PAPER WITH AMERICAN STOCK

THE TEETH IN PHOTOGRAPHY

TONING DEVELOPED PRINTS

HOW TO LEARN RETOUCHING WITHOUT A TEACHER

ACETONE BISULPHITE

TRIFLES

REMOVING THE FILM FROM A CRACKED NEGATIVE
SOME COMMON CAUSES OF AIRBRUSH FAILURES

HANGING PICTURES FLAT

REPRODUCTION OF BLACK-AND-WHITE

TO FIND INFINITE FOCUS

THE CAPABILITIES OF LENSES

CUTTING RUBBER

Preparing Your Own Paper with American Stock

FROM the time that the war in Europe began every avenue for the outlet of photographic paper made in Germany has been closed, and the time may not be far off when photographers may be compelled to prepare a large proportion of paper themselves.

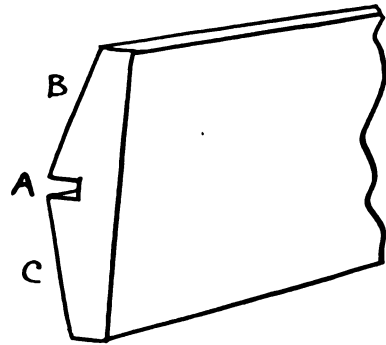
It is not necessary to use paper of German manufacture. There are a number of excellent papers made in the United States that may be employed. One kind in particular is known under the name of "Angora," white, manufactured by the Whiting Paper Company, of Holyoke and New York. This paper is made in sheets measuring 21 x 33 inches. It has a very fine-grained surface, and is made in 70 and 80 pounds to the ream. Either of these papers may be used with confidence if prepared as will be described in this article. The price is very reasonable; half a dozen sheets may be purchased for twenty-one cents, and one dozen for forty cents. Another quality of paper which is capable of yielding excellent results is that known as Whatman's hot-pressed paper, which may be purchased for twelve cents per sheet of a suitable size for easy handling. Also some of the Strathmore papers, made by the Woronoco Paper Company, of Holyoke, Mass.

The writer has prepared a considerable quantity of printing-out paper quite recently, using both the "Angora" and "Whatman's," the last-named paper possesses a stronger grain than the Angora and is of slightly cream color. The peculiar grain is not visible until all the photographic manipulations have been carried out, and during the various operations of toning and fixing it must be handled with more care than the Angora, because it approaches the quality of blotting paper while in a wet condition. The results, however, are unsurpassed by other papers for special purposes.

When preparing paper of the size mentioned it will be advisable to construct a special tray for the work—in fact, a double tray—employing one side for the albumenizing of the paper, and the other side for the sensitizing solution, the bottom of the tray being made of stout glass. The gauge used by the writer was five-sixteenths of an inch thick, good polished plate, three feet

and three-quarters of an inch long, and two feet and three-quarters of an inch wide—the extra three-quarters of an inch permits of the plate being set in a three-eighths-inch groove all around in the wooden framing.

The sketch of the wood framing, in section here given, will explain how the bottom of the tray is fashioned in the middle; hence a double tray, or two trays in one. The groove at *A* is for fitting



the glass into, while the sloping sides, *B* and *C*, give the necessary internal slope to permit of pouring the liquids readily into any receptacle. The mitered corners of the tray are cemented together with thick shellac in place of glue, and the glass plate is held in position and made water-tight by a mixture of common whiting, oxide of iron, and shellac varnish, made into a thick semiliquid mass and placed in the groove where the plate is fitted; the whole wooden framing being drawn together by a piece of stout, strong string being passed around the whole frame, with pieces of wood placed at the corners to prevent the string cutting into the wooden frame when the pressure is applied by placing a stick through the folded string and twisting it several times, so as to shorten the cord and thus draw the joints together with considerable force. Then when this is done, the corners of the woodwork are secured by inserting a seven-eighths or one-inch narrow-gauge screw diagonally, using four screws at each corner. Then when the cord or string is loosened a two-

and-a-half-inch stout screw is inserted at each side, one above the glass plate and the other below, so that the tray becomes firmly put together with no fear of any joint becoming loose. The heads of the screws are sunk into the wood-work and covered with the same cement that holds the glass plate in position, which is more like stone in hardness when it becomes set, at the same time being proof against the action of the solutions used. The spaces left between the groove and the glass plate must be filled in level with the same cement, which as soon as it becomes well set may be trimmed with a sharp wood chisel and sandpaper. Two coats of shellac varnish will complete the interior, and the exterior may be coated with a covering of oxide of iron and shellac.

The tray will now be ready for use. Such a tray will last for years with hard use. It can always be ascertained when it is clean, and may be used for such purposes as pasting large prints without fear of contamination from the bottom of the tray. Of course, if the sheets of paper are cut in halves, then a tray may be made to suit, upon the same lines, half the size.

With such a tray completed, the following solutions may be made up, and three dozen wood clips prepared by dipping the ends into hot paraffin. This is to prevent the wood of the clip absorbing any of the chemical solution, and also to prevent them sticking to the paper. The following formulæ have been put to the test in every-day work, and are being used today, giving excellent results. The solution given here is for matt albumen paper, a genuine matt albumen. The supply of this paper having been stopped, owing to the war, now is the time for photographers to prepare their own paper and thus secure a distinctive class of portraiture.

Albumenizing Solution for Matt Paper

Distilled water	76 fl. oz.
Chloride of ammonium (c.p.)	330 gr.
Chloride of sodium (common salt)	330 gr.

The albumen of one dozen fresh eggs.

Under no condition must any of the yolk be allowed to enter the mixture. In the first place, beat the albumen of half a dozen eggs thoroughly in a moderate-size bowl or basin with a silver-plated or silver fork for five minutes; this to break up the albumen. Add thereto, while the beating is in progress, four fluidounces of the above quantity of distilled water; add this to the mixture, then beat up the other half-dozen eggs in like manner and add this also; then shake the mixture vigorously, employing a wide-mouth bottle and a good-fitting cork. This mixture should be shaken well occasionally during the day and then left for twenty-four hours. At the expiration of this time the albumen will have become well incorporated with the water and the salts. The tray must now be leveled and the mixture passed through a piece of wetted cheesecloth with eight folds, placed over a pitcher, so as to hang in bag form, and the albumen mixture after another good shake-up is passed through the cheesecloth, when it will be ready to pour into the tray, which must be done by pouring the mixture against a strip of

glass so as to prevent the formation of air-bubbles as much as possible.

Having accomplished this, the existing bubbles (there surely will be some) must be removed by drawing over the surface a strip of clean paper, about eight inches long, so as to form a scraper, drawing the bubbles to one end of the tray, where they may be wiped off.

Coating the Paper. Take a sheet of paper (after marking the back with lead-pencil) by the opposite corners diagonally, lowering the center slowly upon the liquid, and lowering the ends. This done, place three of the clips along the farther side of the paper to prevent its curling; then lift one corner so as to uncover the paper to the center. The bubbles that are formed and the spaces that have not touched the liquid must now be brushed over with a flat bristle-brush dipped into the albumen. (Such a brush in tin setting may be bought for five cents.) Turn up each corner in the same way, treating all unwetted spaces in like manner; remove the clips and allow the paper to float until it lies quite flat, which may require four or five minutes. Now lift the sheet at one end, attach a clip at each corner, draw the sheet slowly off the liquid so that it leaves the tray at one end, where it may be suspended to dry. Any marks or streaks of albumen that may adhere to the face of the paper must now be removed by a stroke of the brush that has been used upon the paper. Any number of sheets may be prepared in this way and dried, because paper thus prepared will keep well for any length of time. When the paper has become dry it must be laid back down upon a clean, level, table-top, and the surface rubbed down well with a fold of canton flannel or a folded piece of cheesecloth. This will even the surface and dispel any persistent air-bubbles that have dried with the paper. If it is desired to secure exceptionally brilliant prints, still possessing a perfect matt surface, the sheets may be refloat and suspended by the opposite end. The second floating will give less trouble than the first. This, however, is not necessary. The single coating will answer the purpose, and in the case of Whatman's paper one coating only will suffice.

The excess of albumen may be returned to the stock-bottle for use again if required within a week. After this time the liquid will decompose. Freshly made albumen solution, made as described, may be added to the old and will work perfectly. It will be found advantageous to keep these sheets flat until sensitized, after which they may be rolled or cut to the required sizes and kept, either in a cardboard or a tin case, or plate boxes for the cut sizes, wrapped simply in clean paper. No calcium chloride or any other moisture-absorbing chemical is needed.

Sensitizing. The next operation will be the sensitizing of the paper.

Sensitizing Solution

Distilled water	90 fl. oz.
Recrystallized nitrate of silver	13½ oz. av.
Citric acid (crystals)	2½ oz. av.

Dissolve the nitrate of silver in 70 ounces of the above distilled water, and the citric acid in

the remaining 20 ounces, and when dissolved add it to the nitrate solution. Test with the argentometer, and add distilled water until the solution indicates 60. Finally, add 5 ounces of pure alcohol (not wood alcohol). Shake the mixture well and filter, when it will be ready for use. About 30 ounces of nitrate of silver solution should be made, indicating 75 on the argentometer, a portion of this being added to the sensitizing solution to keep up the strength.

This solution must now be poured into the tray. The paper being ready, with the pencil mark upon the back, it is taken hold of at one corner of each end, and gradually lowered upon the liquid. There will be little or no tendency to curl. The salts within the albumenized surface quickly absorb the nitrate, causing the paper to lie flat. The paper must now be lifted at one corner so as to expose half the sheet of paper (diagonally). If any air-bubbles exist they must be wiped over with the rounded end of a glass rod dipped into the silver solution. Each corner of the paper is submitted to the same operation. The paper must be permitted to remain upon the solution for five minutes, then lifted at one end, attaching two of the clips that have been treated with paraffin, and the sheet drawn over a glass tube at one end of the tray and permitted to drain well. Put one corner of the paper into the tray, then suspend over a glass funnel resting in a bottle so as to receive the drippings until they cease, which is accomplished in the time it takes to float another sheet of paper, the first one being suspended elsewhere to dry.

All these operations of sensitizing and drying must be conducted away from actinic light. An eight c. p. gas jet, or an incandescent lamp covered with pale orange paper, will answer the purpose.

As soon as the sensitized paper has become thoroughly dry it may be rolled up, wrapped in a good quality of white paper, and kept in a closet away from light, or it may be cut to size and packed face to face, wrapped and stored in the ordinary cardboard plate boxes, ready for use. A 21 x 33 sheet will cut into eight pieces 8 x 10, allowing sufficient margin to cut off around the outside to give clean-cut pieces.

The alcohol that is used in the solution is employed for two purposes: (1) to aid in preserving the albumen from being dissolved in the solution and (2) to aid the rapid drying. The citric acid is a preservative, causing the paper to keep well for some time after sensitizing.

Printing the Image. When using this paper in the printing frame a sheet of stout paper must be placed directly upon the paper, which has been made slightly damp by being placed between sheets of damp blotting paper, and a piece of stout blotting paper placed upon this. The back of the frame is then inserted, the springs closed, and exposure to light made. This damp (not wet) pad emits just enough moisture to cause the production of beautiful rich prints. If the paper is used in an exceedingly dry condition the prints are not so brilliant, and the lower half of the picture, when the frame has not been opened, will prove to be more brilliant, owing to the pent-up moisture of the backboard

and padding having contributed the necessary moisture no vent having been given during exposure and examination. The whole process is a very simple one, and is well understood by every practical photographic printer who has used matt albumen paper.

Toning the Paper. Toning the prints may be carried out in either an alkaline gold toning bath or in an acid platinum toning bath. The latter produces exceptionally fine prints of a beautiful black tone. This solution is made up as follows:

Acid Platinum Toning Solution

Distilled water	30 fl. oz.
Chloro-platinite of potassium	15 gr.
Syrupy phosphoric acid	2 dr.

Make up the toning solution as follows:

Take of the above stock solution 4 fluidounces; distilled water, 30 fluidounces; nitric acid, 2 drops. This bath will keep well, and may be used many times over by the addition of an ounce or two of the stock solution at each toning, which must be carried well along until the tendency to blueness disappears. The prints will require to be well-washed before toning, about ten to twelve changes of water will be required until no milkiness is seen. This will indicate that the free nitrate of silver in the paper has been eliminated.

If gold toning is resorted to, the toning solution given here will answer the purpose better than any other. Very fine brown tones may be also obtained with the acid platinum bath as described simply by cutting the time of toning short.

Gold Toning Bath

Water	40 fl. oz.
Sodium carbonate	10 gr.
Sodium acetate	50 gr.
Chloride of gold	3 to 5 gr.

This bath must stand after mixing for twenty-four hours before use. After toning and washing, the prints are fixed in the following solution:

Fixing Bath

Water	60 fl. oz.
Hyposulphite of soda	10 oz. av.
Common salt	2 oz. av.

Ten minutes in this bath will suffice, after which the prints must be well washed for half an hour and suspended to dry. If they are intended to lie quite flat, they must be blotted off and dried between blotters under pressure, changing the blotters several times during a period of ten to twelve hours. Prints so treated will lie perfectly flat and retain this condition.

The sensitizing solution will become slightly discolored after use, but this can be gotten rid of by placing in the solution about 2 tablespoonfuls of kaolin (china clay), costing 10 cents per pound, or 80 grains of bicarbonate of soda may be added to the solution, shaken up well, then stood outdoors exposed to daylight for forty-eight hours, when it may be filtered and the black organic matter rinsed out and placed in the waste crock or barrel for silver waste.

The Teeth in Photography

I DO not recall any paper in the journals or year-books specially treating the above topic, though the matter is one which is not without interest to the portrait photographer, seeing that it is being continually brought before his notice in practice. I should say that perhaps one out of every twenty sitters, or so, will more or less make a claim upon his attention in this connection.

It is remarkable how differently photography presents some things as compared with hand art, or as they appear to the eye. No doubt this is accounted for in large measure by its uncompromising literality, which declines alike to mitigate a defect or to favor a good point beyond its due, without a good deal of what might be called careful circumventing, aided by experience and natural tact. All the facial members demand attention, but I think it will be admitted that the mouth and all about it give most trouble of any of them. The feeling which most sitters have when they first see their photographic presentments is that we have contrived to make the mouth appear too large, too heavy, and so on, but it is more particularly regarding the plenishing of this useful organ I wish to write.

The teeth, however perfect, regular, and beautiful they may be (and their owner justly proud of them), next to nobody wants prominently exhibited in their photographs. Fortunately the majority of people can close the lips in an easy, natural manner, but many cannot do so without a conscious and obvious effort, caused by a prominent interior formation. This obvious strained effect is duly registered by the camera, and the question will often arise in the mind of the operator, Should the sitter close the lips or leave them apart as is his wont? In some cases nothing else than this last can be done, and whenever the choice between a strained effort and that which is usual to the sitter must be made, the latter, with all its defects, is decidedly preferable, because that subtle thing we call expression will be less interfered with in the latter case. It is a risky matter to directly make suggestions regarding the disposition of some members, say of the hands for example, lest we make things worse, and no less is it a risk in reference to the mouth. A request to close it is apt to produce a too firm and compressed appearance with some sitters, who unconsciously assist the operator overmuch.

I have found that a light, reposeful position of the lips is gotten by most people if they just quietly close or shut the teeth together; for many sitters close the lips while the teeth remain apart; but, of course, each sitter must be dealt with on his own merits.

The subject is in some respects a delicate one to manage; but, given an operator who has a proper appreciation of this feeling, much can be accomplished.

When it is decided that the teeth must be left visible they can often be made less conspicuous if the face is turned from the light—the side-light diminished and a high side-light increased. The effect of this is to throw the mouth in the shadow of the upper lip; at the same time care

should be taken to pose that side of the face which will best lend itself to the object in view.

The screening effect of this shadow can be advantageously observed when a portrait of this class is viewed by reflected light through the back of a negative. I have known a sitter to like a portrait seen in this way, who demurred to it in the finish print, which then revealed details not seen in the other form. Let the shadow therefore be deep enough to print well out.

It is a little out of the retoucher's way to make good dental deficiencies on the negative, but when necessary this is just what he should do; modeling here is equally called for with that of skin texture, the removal of wrinkles, etc., and very few will object to it.

Just one more suggestion. It is not in the power of every sitter to easily call up what may be described as a latent smile. Any approach to the idea of smiling reveals the teeth. I have often in such a case secured the wished-for effect by drawing attention away from the mouth by asking the intelligent sitter to smile with the eyes, or to smile in thought, or to call up the conception of a bright, sunny look.

The foregoing remarks are intended to apply to every-day studio portraiture. When genre pictures are aimed at, or costume and character studies projected, especially when children in their fresh growth and beauty are concerned, the conditions are altered, and what in one case may be undesirable, in the other becomes welcome, or is adopted of set purpose.—G. C. M.

Toning Developed Prints

THE desire to obtain colors other than those given by developing *per se* has led the manufacturers and users of bromide and so-called gaslight papers to resort to different methods. Of the many methods used, the one that has found the greatest application is the so-called sulphide method, of which the Velox redeveloper may be taken as a good example. Sulphide tones properly made are permanent. Sufficient time has elapsed since their introduction to thoroughly prove this. Facility of production is also in their favor. The tones are, however, not very varied, nearly always being some shade of sepia. Experiments to obtain some other permanent sulphide tone were made by the writer with what appeared to him to be a fair degree of success. It was found when finished prints made on Velox and Nepera bromide papers (I mention these papers because my experiments were confined to them) were immersed in a solution of ammonium sulphocyanide and sodium sulphide, a good purplish tone, very often equal to a gold tone on printing out paper, was obtained.

The following formula has proved the most satisfactory of any tried:

A

Ammonium sulphocyanide . . . 8 oz.
Water to make 16 fl. oz.

B

Sodium sulphide (crystals) ½ oz.
Water 3 oz.

Following are condensed instructions for its use:

<i>Bath No. 1</i>	
Solution A	1 oz.
Water	3 oz.
Solution B	1 dr.
Mix just before toning.	

Immerse the fixed and washed (and perfectly dried) print. The toning action begins almost immediately, ranging through the purple tones first and then into the sepias.

Allow the print to remain in the toner until the desired color is reached, then wash fifteen minutes in running water and dry as usual. With the bath at 70° to 80° F. prints will tone in from fifteen to forty minutes; at 90° to 100° F., five to fifteen minutes will suffice; but it is not advisable to use the bath at a higher temperature than 100° F., owing to its softening action on the film. Prints developed with Velox N. A. developer tone quicker than prints developed with ordinary developer.

The rapidity of the toning may also be increased by adding more of solution B, but not more than 1 dram should be added to the original solution at one time, as this would render the bath too alkaline and soften the film. It works best when freshly mixed and after forty minutes or so more B solution may be added. The old bath may be kept for future toning, but before use it should be filtered or decanted to remove the white precipitate formed, and fresh B solution added, but it should be discarded when it becomes so alkaline as to affect the film.

It will be found that the toning is influenced somewhat by the character of the negative used, different degrees of density in the negative affecting the silver deposit on the print and the subsequent action of the toning solution. It will also appear that matt papers tone more readily than the glossy, and that purple tones are easiest secured on glossy papers. It must be confessed that the laws governing the action of this bath are not as thoroughly known as could be desired. Sometimes it will work quite rapidly, and again, under apparently the same conditions, it works much slower.

An Alternative Formula. Further experiments have shown that its certainty of action could be greatly improved by mixing with it hypo alum toning solution, made according to the following formula:

<i>C</i>	
Hypo	10 oz.
Water	50 oz.
Heat to boiling and add—	
Powdered common alum	2 oz.

Allow to stand until cold. It improves by standing.

<i>Bath No. 2</i>	
A	$\frac{1}{2}$ oz.
C	$\frac{1}{2}$ oz.
Water	3 oz.
B	1 dr.

When B is added the solution is clouded by the precipitate aluminum hydroxide. This precipitate does not interfere with the toning action.

This latter bath (No. 2) yields tones equal to

and quite often superior to the former bath (No. 1).

It also smells more strongly of hydrogen sulphide, and it is not advisable to use it where the ventilation is poor. As its action ceases more of B can be added. The latter bath has also better lasting qualities. I have known it to tone without adding an additional quantity of B after it has stood overnight.

An Improvement to Sulphide Tones. Prints from some negatives when bleached and redeveloped with sulphide solution sometimes incline more to the yellow than is desirable. Having ascertained this fact, colder tones can be obtained on subsequent prints to be toned by using bath No. 1 as a preliminary bath. How long the print should remain in bath No. 1 cannot be stated with exactness, as there are several factors to be taken into consideration; chief among these are (1) how much the color given by the bleach and redeveloping method differs from the desired color; (2) how fresh bath No. 1 is. The fresher the bath the quicker it works. Other things being equal, the longer the print remains in bath No. 1 the colder the tone. In a freshly prepared bath at the ordinary temperature even fifteen seconds is enough to effect a change in color in the finished print.

As a general thing any immersion—even one falling far short of the time necessary to produce a visible effect—is quickly made apparent by the print refusing to bleach as much as it would have done were it untreated when placed in the bleaching solution. Prints should be well washed before placing in bleaching solution, and should remain in it from five to ten minutes, or until it is certain that the bleaching is completed. After bleaching, prints should be rinsed free from bleaching solution and redeveloped as recommended in the Velox developer instructions.

What chemical reactions take place in what I would call the sulphide sulphocyanide method of toning I have not investigated far enough to state.

However, hydrogen sulphide is released, and this in its nascent condition no doubt has power enough to attack the silver of the image. It is also certain that other reactions have an effect, for if the ammonium sulphocyanide is replaced by an equal weight of the potassium salt the toning action is very much slower.

To the question, Why does this method give a different color from that obtained by simple bleaching and redeveloping with sulphide solution? It might be answered: Because the conversion of the silver is not so complete as in the latter process. In reply I would say that it would be hard to imagine the colors obtained on some prints as resulting from a combination of sepia and black.

As they are, the processes described are practical, but there is room for improvement.

How to Learn Retouching without a Teacher

RETOUCHING! Oh, I don't go in for portraits, therefore I'm not interested in retouching. That, my friend, is just where you make a mistake, or rather two mistakes. The first is in thinking that retouching is only of use or interest to the portrait-worker, and the second mistake

follows—like Euclid's propositions—from the first, *i. e.*, not "going in" for retouching your landscape or other subject negatives. For there are very few negatives of any kind or subject which cannot be improved by a little retouching. But, alas! another very common mistake is, that having found how easy it is to acquire the elements of retouching, the thoughtless hurry-scurry worker does far, far too much. So that the last state of his negative is worse than the first: he has pencilled not wisely but too well. As an old hand at retouching, who has from time to time taught several friends the elements of the matter in one personal lesson, I strongly recommend the beginner to start off with almost any kind of a subject rather than a portrait. In a portrait we are handicapped in two ways: first, by being too much concerned with facial expression; secondly, in this work we need the delicacy of handling which only comes after some practice. Therefore I say leave portraiture aside at first, and take, let us say, a small landscape negative. Let this be one that we have discarded so that we may have no qualms about spoiling it.

Our requirements are very few and cheap. First, a three H pencil (Hardtmuth's) in cedar (hexagonal).

Second, some retouching medium which may be bought in twelve-cent bottles from any dealer, or we can prepare our own at next to no cost. Take a quite clean and perfectly dry ordinary size medicine bottle (*e. g.*, 6 or 8 oz.); half-fill this with good turpentine. Take a bit of ordinary resin just about the size of a small cherry, or, say, twice the size of a full-grown green pea. Crush into powder and add to the turpentine in the bottle. Then stand the bottle in a basin of warm water and shake occasionally. Then set aside for twelve hours. Take now a small bottle—an old clean scent-bottle is just the thing—and carefully decant about a dessertspoonful of the clear part of the turpentine and resin mixture. Point the pencil with rather long sloping cuts of the wood, laying bare about half an inch of the lead, and point the lead by rubbing on a bit of sand-paper, or old file, or rough ground glass, or a large flat pebble from a shingle beach. The lead must be as sharply pointed as an ordinary pin.

Now with P. O. P. make a print from the negative. Remove the back of the printing frame; with stopper of the small scent-bottle apply two or three (not more) drops of medium to the film, and then rub this all over the film with a spiral or circular motion, using a bit of clean, dry fluffless rag. Then wait about ten minutes for most of the turpentine to evaporate. Meanwhile, by means of some books, tilt up the front edge of the printing frame at a convenient angle. Put the work table in front of a window. Lay a sheet of clean white paper on the table just in front of the negative, so that when we look through the negative toward the white paper we have an evenly lighted white paper acting as a reflecting light background. Shade the eyes from light by a piece of stiff brown paper held flat against the upper part of the forehead by means of a piece of broad elastic, or lower the window blind so that the

eyes are shaded, but that good skylight falls on the paper reflector. Now examine the print in a shady place. Note some part—probably in the foreground, where there are several small patches of light and shade: perhaps a tuft of grass showing some nearly white lines and dark lines. Turn to the negative, and begin by gently dotting and touching with light, short strokes these lines and patches of nearly clear glass. At first little or no effect seems to come from our dots and strokes; but patience and blacklead will begin to show a little presently.

Do not begin by confining your "touch" to any particular kind of dot or stroke, but use all kinds of touches; sometimes a dot with a tail to it like a comma, sometimes two or three lines close together, and then crossed at a slight angle by other lines; sometimes a spiral touch, sometimes a wavy line, sometimes a to-and-fro touch, as though trying to sharpen the point. When your patience is exhausted and you have done your best to fill up the thinnest parts of the corner of the negative, then take another print and compare the two. If the prints are not overdarkly printed probably you will be surprised to find that your retouching shows more than you expected. Probably, also, you will notice that it prints rather more "scratchy" than you quite like. But that you will get over with a little practice and experience.

Do not trouble about pictorial considerations at first, but go on making experiments with first one kind of touch and then another, until you see for yourself just exactly how much lead on the negative is required to produce a certain effect. Then take two small patches which print a little different and work on the thinner one, until they print exactly the same strength. This will lay a good and useful foundation of knowledge on which we shall be able to build some useful experiments in another chapter.

Acetone Bisulphite

THE use of acetone bisulphite in the "aromatic" and "phenol" developers, such as eikonogen, glycin, and all the others, is not so general as its importance would warrant.

For a number of reasons it is preferable to sodium sulphite, not the least among which is its cheapness; only one-eighth of the quantity is required of "acetone sulphite" if it be used in place of the sodium salt.

Solutions containing up to 50 per cent. of the organic salt will keep excellently, and if concentrated solutions of the commercial developers be diluted with a 2 per cent. solution of acetone sulphite instead of water, they will be found to last longer and be far more active.

A beautiful etching-like tone may be produced on bromide paper by giving an exposure ten times as long as normally necessary and then developing with a solution in which the sodium sulphite is replaced by one-eighth of its weight of acetone bisulphite.

If it be added to a ready-made normal developer, it will act as a restrainer.

Edinol	4 dr.
Water (distilled)	8½ oz.
Acetone bisulphite	1 dr.

This is a useful formula if working with a slow shutter on rapid plates in a bright light. By means of such a solution as this, if a plate has been hopelessly overexposed, it may be developed to give a negative, to all appearances, properly exposed.

The addition of a little of the acetone salt to the hypo keeps the fixing bath clear and fresh for a long time.

Perhaps the chemist may not have acetone bisulphite in stock, in which case it may be easily made by anyone having, as most photographers have nowadays, a little chemical apparatus and the skill to put it together.

First, make a strong solution of potassium metabisulphite in water, and set the bottle containing it in a bowl of cold water or ice. Fit a small flask with a cork and glass tube, which must dip well below the surface of the bisulphite solution in the bottle. No rubber joints may be used, nor is the rubber cork permissible, on account of the action acetone has upon it. Half-fill the flask with acetone, and dip it into a saucepan of boiling water. The acetone will quickly evaporate and the gas pass into the bisulphite, where, after a few minutes, white crystals will be seen forming. When at last no more are thrown down, the liquid may be drained off and the crystals of acetone bisulphite dried between sheets of blotting-paper under slight pressure (pass them through the mangle, for instance). In this condition it will keep indefinitely. A warning must be given in conclusion, and that is, have no light near, as acetone vapor is highly inflammable.

Trifles

PERHAPS one might better entitle this note by some such phrase as "the importance of certain trilling matters in photography." In all departments of mundane affairs we may find examples of the importance of apparently small things, and the wisdom of our forefathers found expression in such wise saws as "Take care of the pence and the pounds will take care of themselves," "A straw will show which way the wind blows," "A pebble will determine the course of a river," and so on.

It is certainly true that often a quite trivial matter may be the cause of a photographic failure.

Dust. For instance, suppose a lens be left uncapped on a shelf for a single night in a rather, but not very, dusty room, *i. e.*, such a room as that occupied by the majority of town dwellers, the room having a carpet in it and a few people walking about the room during the day. These people will stir up a cloud of very fine dust, and some of this during the night will settle down on the unprotected glass of the lens. Now, such a fine layer as this is quite likely to escape our notice, but yet it is quite enough to interfere with the best performance of the lens. But one or two black smuts settling on the otherwise clean surface of the lens would be noticed and removed, yet if they be left on the lens they will do very little harm as regards interfering with the performance of the lens. Their action simply amounts to stopping, perhaps, one hundredth or less per cent. of the light, just as a

postage stamp stuck on the glass of a shop window might stop a trivial amount of light, but the fine layer of dust is acting in a way comparable to a piece of very finely ground glass; and if we want to see what that means, all we have to do is to hold the focussing screen of our camera between our eye and the sun or a lamp flame.

Reflections. Then, again, what a lot of mischief may come from any part of the inside of the lens tube or fitting wearing bright and becoming a reflecting surface. How many ghost-like, mysterious markings on negatives could be traced to the edges of stops or iris diaphragms wearing bright.

Speaking of reflections, let the reader be warned against the common mistake of thinking that reflections may only come from the lens, and if that be a good dead-black inside, nothing else need be thought about. On the contrary, it is not at all uncommon to find the woodwork inside the body of the camera bright enough to do harm. To verify this warning let the reader remove the lens and ground glass, and then putting his head under the focussing cloth, point the camera to any strong light, *e. g.*, the sun or lamp, and look for reflecting surfaces all around the part where the plate is when it is being exposed in the camera.

Faulty Shutters. Another source of trouble which more than once has puzzled the unfortunate worker is a tiny pinhole in the thin part of a roller blind shutter. As we do not often examine the inside of the camera when the blind is down, this trouble may exist and spoil many a plate before the cause is even so much as suspected.

A Curious Case. The present writer some time ago had a curious and puzzling experience with a certain camera. At somewhat long and rare intervals a plate would be fogged, and though the camera was examined again and again, the cause could not be found, until one day the ground glass was being turned back to make room for the double back plate holder, when a spot of light was noticed. To make a long story short, the cause of the trouble was that when the rising front of the camera was in one certain position an old screw hole inside the camera came opposite the slot of light and admitted light and fogged the plate. In a case of this kind one might use that camera every day for a lifetime and yet never hit upon the one position to bring mischief about.

A Grain of Sand. Another case came within the writer's experience when the whole of the exposures of an outing with a hand camera were fogged because one grain of sand somehow or other had found its way into the mechanism of the shutter and prevented the shutter closing quite light-tight.

Another trouble which may come from a grain of sand is in causing the draw slide of a plate holder to jam. Yet another trouble from the same source is when a grain of sand gets between two plates when repacked after exposure for the return home. If the grain of sand gets on the film side it will most likely cut a nasty hole in the film, and this is quite sure to be in a place of some pictorial importance. If the sand

grain gets on the glass side it is quite enough to cause a crack or break in the glass if the plates are packed tightly.

In a Dark-room. To go into the dark-room for a moment, we are at once faced with a score of little things which may give us a lot of trouble if they are not attended to with some care. A dirty bottle or old cork is used for a new solution, and trouble results, or a stopper is laid down on a dirty work table for a moment, where it picks up some contamination which it carries to the bottle and contents on its return. Perhaps the trouble takes the form of fine spots or pin-hole markings which are not, in this case, due to dust (the usual cause), but to the use of a developer taken from a bottle in which some sediment has accumulated, and as the solutions get used up this sediment gets stirred up, and so finds its way on to the plate. Again, small dust-like markings may at times be traced to chemical dust floating in the air, such as pyro, finding its way onto the plate, or it may be rust brought down by the water-supply pipe from the metal storage tank or cistern or water pipes, or it may be sand or lime particles in the water.

The foregoing little things, all mere trifles, things easily overlooked, and truly as easily avoided when thought of, are given simply as examples.

When one thinks of the many ways in which it is possible for the adventures of a negative or print to take an unfortunate turn, the surprise is that ever a negative escapes the almost countless chances of coming to grief in one way or another among the many trifles which beset its path.

Removing the Film from a Cracked Negative

It sometimes happens that a negative of value becomes cracked in such a manner that the glass only is broken, not the film. There are several ways by which the difficulty of printing from such a negative may be overcome so as not to show the crack. One method in particular is the insertion of a piece of albumenized paper or good tissue paper between the face of the negative and a piece of clean glass plate the size of the negative, then binding the two together with strips of gummed paper. The best results are obtained by this plan when albumenized paper is used.

Sometimes more than one crack is produced in a negative, in which case the difficulty of utilizing such a defective plate is greatly increased.

Many times the question of how to best remove the film and retransfer it to another glass plate has arisen. One difficulty—if not the most important—has presented itself, namely, how to penetrate the substratum which holds the gelatin film composing the negative, so as to release it from the glass support, because the substratum is generally a compound of gelatin and chrome alum, which is harder and more adherent to the glass than the gelatin film. This is often noticed when cleaning old negatives with hot water and carbonate of soda. Although the film dissolves from the plate perfectly, the substratum still remains in patches in such an

adherent form as to require the use of a knife to effect its complete removal.

There is a method of accomplishing this without the use of either hot water, soda, potash, or of strong mineral acids, none of which is certain in its action.

The process here to be described is one of great simplicity—one that can be used with certainty by any person, the solution employed being quite cold, and the application of heat being quite unnecessary. In fact, the colder the solution the better the result.

If the negative is a portrait and the face has been retouched, it will be advisable to remove the retouching with a tuft of cotton moistened with turpentine and cleaned off thoroughly. This, however, is not absolutely necessary, for a film can be removed just as well with the retouching on as if it had been removed. Which-ever plan is adopted, a small amount of retouching will be required after retransfer. One point in particular must be attended to: the trays used must be thoroughly clean, and only hard rubber or composition trays can be employed, for reasons which will be explained. The bottles that are to contain the stripping solutions must also be quite clean. In fact, use new ones so as to be quite sure of this. The results will repay those who undertake this extra trouble.

The composition of the chemicals given below is the same as that known as "Magus." It is not only simple, but sure and certain in its action. Prepare the two following solutions in two separate bottles:

No. 1

Fluoride of sodium $\frac{1}{2}$ oz.
Water (ordinary) 16 oz.

Cork this bottle, shake well, and mark "No. 1."

No. 2

Citric acid in powder 1 oz.
Water 16 oz.

Shake this well, cork it, and mark "No. 2."

Have at hand a clean glass plate, say $6\frac{1}{2} \times 8\frac{1}{2}$, in a tray of clean, cold water. If the negative to be stripped is 5×7 it should be transferred to a $6\frac{1}{2} \times 8\frac{1}{2}$ plate, so that if the film is not placed quite truly, it will be a very easy matter to cut the plate to the right size after the film has dried. To strip the film from the cracked negative, take 4 fluidounces of No. 1 and pour into a tray of hard rubber, $6\frac{1}{2} \times 8\frac{1}{2}$; then add 4 ounces of No. 2. Rock the tray so as to obtain complete admixture of the two solutions. Then immerse the negative, film side uppermost; carefully rock the tray, first endwise, then crosswise. Allow it to stand for half a minute, then rock again. It will now be seen that the film is frilling slightly at the edges. Rock the pan a little. Now, with the forefingers and thumbs of each hand, lift the film clean off the cracked plate, place it in the water above the clean glass plate, lift the plate by the two top corners, and adjust the film so as to leave a clean margin all round. Lift the plate and film together by the top, and drain slightly. Lay the plate in a horizontal position and carefully adjust the film so that there are no air-bubbles present. See that the film perfectly adheres to the glass support.

Then, after draining off the excess of water, allow the transferred film to remain in a horizontal position until dry. Never allow the drying to take place with the plate in a vertical position, for the film may become split. There is just enough tackiness upon this side of the film to admit of its adhering firmly to the glass plate. By this method of transfer a valuable negative may be saved for future usefulness.

A very useful adjunct for this class of work is a very thin *soft* squeegee. With the aid of this handy tool the transferred film may be set down very evenly upon its new support and the excess of water removed at the same time.

It may be advisable to make a trial or two upon some discarded negative before attempting the transfer desired. This will give the practice and confidence necessary for the final operation.

The process will appear marvellous to those who have never performed such an operation. The true action is this: When any acid is brought into contact with fluoride of sodium (citric acid in particular), the element fluoride separates from the sodium base and attacks the glass surface through the porosity of the film. By this means the adherence of the gelatin film, together with its substratum, is released, the film being then easily lifted. At the same time the citric acid combines with the sodium to form citric of sodium, which remains in the water. Several negatives may be stripped in the same solution.

Some Common Causes of Airbrush Failures

THE advent of the airbrush as a tool for distributing color has opened up a field of expansion hitherto undreamt of by artists, designers, and ticket writers, etc.; but this valuable little ally will respond with full efficiency only on condition that certain limitations of its power be recognized and made allowance for. Ignorance and lack of proper care will result in failure and unmerited abuse of either the tool, the colors used, or possibly both, for reasons which I will endeavor to explain.

The best-known type of airbrush has a long, fine-pointed needle, fitting through a platinum sleeve so closely and accurately that when in its forward position it would be difficult, nay impossible, upon merely pressing down the lever to allow even clean water to escape, but upon drawing back this lever (to which the needle is attached), with the downward pressure still maintained, a fine spray will be scattered which will increase in volume the farther the needle is drawn back. The full extent of the needle stroke does not exceed $\frac{1}{8}$ of an inch, and so gradual is the tapering that, even when drawn back to its maximum, only the thinnest mixture of color can pass evenly between the sleeve and the needle. It follows, therefore, that if we are to obtain the most satisfactory results it will be necessary to build up our tint by repeated spraying with thin color until we have reached the brightness or strength required. Such work, when finished, will be practically grainless and not liable to rub off, provided, of course, that the drawing surface is free from greasiness or has been primed by either of the following methods:

(1) Rubbed over gently with a pad of cotton-

wool dipped in prepared pumice powder, (2) sponged over with weak ox-gall, or (3) coated with a thin substratum of albumen or gelatin. This priming is necessary only when working over highly glazed cards, or photographic surfaces which are liable to repel color. Bristol boards, or other drawing-papers will not require this treatment if quite clean.

It is of the utmost importance that the airbrush should be kept scrupulously clean, and never laid aside with a trace of color remaining in it, or trouble will assuredly follow. Pass two or three lots of clean water through it before commencing work, also on completion, before putting it away in its case. During use it should occasionally have the inside of the nozzle cleaned with the point of a brush, and this very frequently if body color is being used, or it will accumulate around the point of the needle and cause trouble by frequent spitting.

Quite the majority of airbrush failures are traceable to the use of color mixed much too strong or thick, instead of building up gradually with weaker color in the manner already described. Ticket writers and designers are the people most prone to err in this direction when attempting to obtain their strong effects by one short spraying of color used much too thick. Such methods are foredoomed to failure, for not only has the spray a disagreeable sandy grain, but it will also possess a strong tendency to rub off on the slightest provocation, for the following reason:

The stability of a water-color tint depends upon a certain quality of absorption in the paper surface, and when this is laid on by hand with a full sable or camel-hair brush, the best conditions have been fulfilled to secure its firm attachment, such wash being of a united or continuous character. Subsequent washes may be added without disturbing the previous ones, provided, of course, that these have been allowed to dry.

Now, if for any reason it is thought desirable to augment these hand-laid tints by finishing ones sprayed over with the airbrush, this may safely be done.

The case is very different with color laid on entirely by the airbrush. An airbrush spray, even when applied under the most favorable conditions, has not the same hold of the drawing surface as the wash painted on by hand. The color is blown over the paper in the form of scattered dots separated from each other at varying intervals according to the distance the point of the pen is held from the surface. The farther away, the wider apart the dots, and the more liability to rub off at this stage, because much of the moisture is evaporated from the color before it reaches the paper, and its hold is somewhat precarious. The sole chance it has of adhering firmly depends upon repeated applications until these isolated dots are joined by others and so merged into a continuous tone. When strong or imperfectly mixed color is used, this scattering action is still more pronounced, and with it there is increased tendency to rub off, because the air-pressure, taxed to its utmost capacity in drawing it through so small an aperture, leaves these minute color particles insufficient moisture with which to attach themselves firmly. In a vast number of cases the airbrush

tint represents only ground work upon which it is necessary to add further drawing by means of brush or pen, and it is here that serious difficulty is met with, because, unlike the hand-laid washes, the airbrush one, parched on its surface for the reason already described, is of a porous character and easily works up under the brush or ruling pen, and absorbs the color, causing it to spread in a manner suggestive of blotting paper. This difficulty can best be overcome by rubbing over the airbrushed surface when quite dry, with a clean pad of cotton-wool, using only sufficient pressure to remove the "bloom." If a little gum water be now added to the color in ruling pen or brush, but not sufficient to allow of the added work drying with a glaze, it will be found to work satisfactorily.

Hanging Pictures Flat

To a certain extent the variable slope forward of pictures in a reception-room, corridor, or gallery introduces an irregularity which destroys to some eyes the effect of the display. This is, we think, felt most of all in a corridor, or in any rather long and somewhat narrow room where a side view of the main display is readily obtained. In such cases there is a great deal to be said for keeping the frames quite flat against the wall. There are various ways in which this may be done. One method is to use two small screw-eyes in the top of the frame, and to drive two small brass pins provided with heads into the wall. The frame then hangs quite vertically and the back of it is in contact with the wall. The screw-eyes, however, are apt to detract from the effect. When the walls are match-boarded, and then covered with some decorative material, as is often the case in a studio or the corridor leading to it, pictures may be hung flat in a sort of panel by the use of glass plates. The effect is not good, however, except in cases where a number of frames all the same size are to be displayed. To each of the frames—*i. e.*, the picture frames—three glass plates must be attached, two at the bottom edge near the corners, and one at the top in the center. The lowest row must be hung first, and if there is a dado rail it may be possible to slip the glass plates at the bottom of the picture frames behind this; otherwise each picture frame must be fixed by three screws, one for each glass plate. The pictures of the second row will rest on the upper edges of their brothers of the lower row, the two glass plates slipping between the wall and the lower picture, and the single glass plate at the top being screwed to the wall. The work of hanging is thus fairly rapid, because once a start is made each picture only requires one screw to hold it in place. Nor need these screws be large, as a three-eighths screw neatly screwed home will attach a glass plate securely enough to hold the weight of an average man. Of course, such a method is only likely to be employed in cases where a display of frames will remain up for some little time. With some kinds of plaster wall the method is equally applicable, provided the pictures are of moderate size. A hole should be made in the wall by tapping a bradawl in gently, and then it will be found that a half-

inch, *thin* screw may be screwed in, and will hold quite well. With some of the hard modern plasters we would not attempt this, however, and in any case the screw-hole will be more noticeable afterward than the hole made by a small pin or nail.

Another method, quicker than that described in the preceding paragraph, but not so readily applicable to a close-hung panel, is more simple in execution than it is to describe. Suppose we have a frame the rebate size of which is exactly 12 x 10—that is, the outside size of glass and backboard is 12 x 10. Suppose the picture in this frame is the upright way on. Now, if we drive two small nails into the wall, both on the same level and 6 inches apart, we can hang our picture on these nails, assuming that the rebate is a deep one, as is the case with almost all the narrow beadings used for small frames nowadays. In other words, the backboard must not be flush with the back of the frame, but must be sunk, say, three-eighths of an inch. But the frame so resting by its upper member on the two small nails will be in a precarious position, because it is only *resting* and is not *held*. Suppose, however, we drive the nails ten inches apart instead of six, we shall find that we cannot hang the frame on them except in this way. Hold the frame flat against the wall, with one of the nails right into the top left-hand corner. Now lift the top right-hand corner higher up the wall, covering up the second or right-hand nail; then, keeping the picture frame pressed quite flat against the wall, gently draw the right-hand side down until the picture is "straight." It will now be found quite firm, but may be taken down at any time by reversing the process. The handiest nails are the small brass pins sold for nailing brass picture hooks to the wall. In driving them into the wall, avoid placing them with too great a distance between, or the corners of the picture frame may be forced apart, while too small a distance tends to insecurity. A tap with the hammer will often bend the nails toward each other or apart, as may be needed, and it is the heads of these special nails which hold the picture frame, and not the shanks.—*British Journal of Photography*.

Reproduction of Black-and-white

IN the reproduction of subjects in black-and-white—that is, manuscripts, engravings, line drawings, plans, etc.—a method must be employed entirely different from that made use of in reproducing subjects having half-tones or gradations of light and shade.

We must have an entirely different mode of illumination, and must endeavor to get rid of the grain of the paper, or rather the shadow of the grain. A flat light is indispensable, and this is best secured out of doors, the illumination coming from the front.

First let us consider the kind of plate. For some kinds of work the so-called process plate or photomechanical plate may be made use of; but if the original is an old manuscript such a plate is not as good as a quick bromide plate, but the best kind of plate for old documents is an orthochromatic plate.

Mr. F. E. Ives recommends the following method for orthochromatizing an ordinary plate: Dissolve 1 grain erythrosin in 4 ounces alcohol. Filter the solution. Bathe the plates in this for two minutes, rocking the tray, then wash in distilled water and dry.

As regards exposure, it is best to make a trial plate for varying periods. Give the whole plate thirty seconds, then push in the slider a certain distance, giving forty-five seconds, or fifteen seconds more, and so until you give ninety seconds. One cannot get the best results without ample exposure, but excessive exposure is to be avoided, as it clogs up the lines and defeats efforts after density. The lines in the negative should be clear glass and the page dense black.

The Developer. Pyro is capable of giving density, but it has a tendency to veiling or of showing the characteristic pyro stain. Hydroquinone is preferable to any other agent.

Lumière's formula is perhaps the best:

Hydroquinone	8 gr.
Sodium sulphite (gran.)	80 gr.
Formaldehyde	1 dr.
Distilled water	1 oz.

This contains neither alkali nor bromide, but yields very intense negatives. In cold weather this developer must be warmed to 70°.

The main thing to be observed for black-and-white work is clear lines, so if it should happen that your developer gives any indication of veiling, stop developing at once, wash off and fix thoroughly, and again wash well from hypo.

If on examination any sign of veiling is visible in the negative, it will be absolutely necessary to clear up the plate before intensification.

Belitzski's formula is good:

Potassium ferric oxalate	10 gm.
Sodium sulphite (gran.)	8 gm.
Oxalic acid	3 gm.
Hypo solution (1)	50 c.c.
Water	200 c.c.

Flow the plate over with this until the lines are clear glass and then wash.

Another clearer (Bartlett's) is:

Perchloride of iron (ferric chloride)	60 gr.
Citric acid	120 gr.
Water	16 oz.

Bathe the negative in this and then thoroughly wash.

A good intensifier is iodide of mercury, made by adding a solution of potassium iodide to a solution of mercuric chloride (10 per cent. solution) until the brilliant precipitate formed just redissolves. After intensification, soak for ten minutes in sodium sulphite and wash.

Pencil drawings sometimes give much trouble in copying. A piece of very fine ground glass placed in close contact over the pencil drawing in a printing frame, and the copy made through this, gives better results than direct copying.

Blue prints are, of course, hard to reproduce. A yellow screen placed in front of the print turns the lines into a dirty green. An orthochromatic plate is then made use of.

The paper employed will depend upon the character of the print required. Platinum, of

course, may be made to give rich black lines, but bromide paper, properly treated, gives as good results at much less cost.

Ferrous oxalate must be used, about one part of iron solution to five parts of oxalate solution. Add the iron to the oxalate and about five drops of 10 per cent. solution of bromide of potassium and five drops of 10 per cent. solution of citric acid to every six ounces of developer.

To Find Infinite Focus

MULTIPLY equivalent focus with its own figure, and then by 100. Divide this total with speed mark, multiplying by 12—thus a lens F.6— $6\frac{1}{2}$ equivalent focus would result thus: $6\frac{1}{2} \times 6\frac{1}{2} = 44\frac{1}{4} \times 100 = 4425$ —divided by F.6 = $6 \times 12 = 72/4425 = 58\frac{1}{2}$ feet.

The Capabilities of Lenses

To the majority of photographers lenses for portraiture present their greatest interest, and it is here, perhaps, that there is most room for error in selection. There are a few elementary facts which must be borne in mind when comparing lenses, and these we will briefly recapitulate. The drawing or perspective of a picture is regulated entirely by the point of view or distance between the object and the observer, or, in our case, the lens. The form of the lens, be it single, rectilinear portrait combination, or anastigmat, does not alter the result, nor does the focal length. This latter does, of course, affect the size of the image, and if the focal length be too short, the lens cannot be used at such a distance as will give an image of the desired size in agreeable perspective. If the diaphragms are correctly marked by the maker with the standard apertures, or, in any case, in fractions of the focal-length, the exposure required will be the same if the same aperture be used—that is to say, that practically any lens marked with an aperture of $f/8$ will require, under the same conditions, the same exposure as any other lens of the same aperture. There may be small variations due to the thickness or color of the glass, but these do not materially affect the exposure.

Let us start by comparing the older type of portrait lens, usually called the Petzval, with the newer portrait anastigmats. In order to do this, we must altogether ignore the makers' statements as to the size of plate for which the lens is suited, for times have changed, and we do not now use a lens to the limit of its covering power, but start by selecting a focal length which we know will give satisfactory drawing. For a cabinet portrait most artistic workers demand a focal length of at least sixteen inches, and at this length there is little to choose between the costly anastigmat and the portrait lens upon a field of eight inches diameter, which is all we need for a cabinet negative. It is true that when we go beyond this limit, the definition of the portrait lens falls off rapidly, while that of the anastigmat remains good over a circle equal to its focal length. We recently had the opportunity of comparing the performance of two lenses, each having a focal length of about sixteen inches, one being a very old portrait lens

while the other was a first-class anastigmat. The former had a maximum aperture of $f/4$, while the latter had one of $f/5.6$. Stopping the portrait lens down to this aperture, duplicate exposures were made, and it would have puzzled anyone to say with which lens either negative had been taken. The price of the portrait lens was exactly one-fourth of that of the anastigmat. Now for the other side of the question. The portrait lens was, so to speak, fully extended by this test. By using a smaller stop, say $f/8$, a $6\frac{1}{2} \times 8\frac{1}{2}$ plate might have been decently covered, whereas the anastigmat would have given a well-defined full length upon a 10×12 plate if necessary. Naturally the stand-point would have to be too near to be pleasing, while a large head would be out of the question on account of the drawing.

With smaller sizes the portrait lens does not show up so well, and the anastigmat, if procurable, should always be chosen, especially for full lengths. Some portrait lenses having a round field work excellently upon seated figures, but if the swing-back be used the flat-field lens is equally good, while the full aperture being available for standing figures minimizes the chances of movement.

With lenses for groups and outdoor work the same arguments apply. If the focal length be great in comparison with the size of the plate, the rectilinear and symmetrical types are quite satisfactory, but when a focal length equal to or less than the diagonal of the plate is needed, then the superiority of the anastigmat is seen. Even then much may be done with the rectilinear by reducing the aperture, and this is generally necessary to secure sufficient depth of field.

It is in the instantaneous branch of photography that the anastigmat shows to the best advantage. Here the older forms of lens are left hopelessly astern. The great covering power allows of a short focal length being employed, and we find that one of about seven inches, the aperture being $f/4.5$, is commonly used for press work. Our advice to the budding press photographer is to look on a good lens as a pearl of great price, and to give all that he can to secure it.—*British Journal of Photography*.

Cutting Rubber

WHEN a rubber stopper has to be bored or cut the tool should be kept moistened with a strong solution of caustic potash or caustic soda; it will then be found that the knife cuts as easily as it will cut ordinary cork.

PATENT NEWS

Under this heading it is proposed to include each month a list of all the U. S. Patents; and brief extracts of the more important, and to include also such foreign patents as present special features.

Copies of any patent can be obtained from the Commissioner of Patents, Washington, D. C. Price, five cents each.

Photographic Shutter. Paul J. Marks. 1238422.
Photographic Shutter. Andrew Wollensak. 1238471.

Focussing Device for Cameras. John E. Woodbury. 1238474.

Combined Finding and Focussing Mechanism for Cameras. John E. Woodbury. 1238473.

Method of and Means for Producing Designations on Photographically Sensitive Elements. Henry J. Gaisman. 1238504.

Photographic Apparatus. Henry J. Gaisman. 1238505.

Method of and Device for Designating Photographic Exposures. Harry J. Gaisman. 1238506.

Shutter-operating Attachment for Cameras. Harry C. Atwood. 1238621.

Autographic Attachment for Cameras. Z. E. House. 1238674.

Film-handling Apparatus. George R. Macomber. 1238694.

Color Photography. Frederick C. Ives. 1238775.

Aerial Carrier for Photographic Films. William F. Folmer. 1238904.

Apparatus for Operating Flashlights. Herbert V. Sheppard. 1238948.

Photographic Camera. Robert Kroedel. 1239017.

Photographic Shutter. Paul J. Marks. 1239025.

Motion Picture Film Cleaner. M. E. Noble. 1239295.

Reel for Picture Machines. Wm. E. Millar. 1239504.

Photographic Film Cartridge. Harrison Gindele. 1240335.

Photographic Film. Frederick E. Ives. 1240344.

Photographic Print Washing Machine. Elmer Crusey. 1240425.

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Focussing Camera. Joseph Becker. 1240651.

Focussing Camera. Joseph Becker. 1240788.

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ARTISTIC LIGHTING

By Felix Raymer

WORK OF FREDERICK POHLE

By Sidney Allan

A FEW IMPORTANT POINTS IN
COMMERCIAL PHOTOGRAPHY

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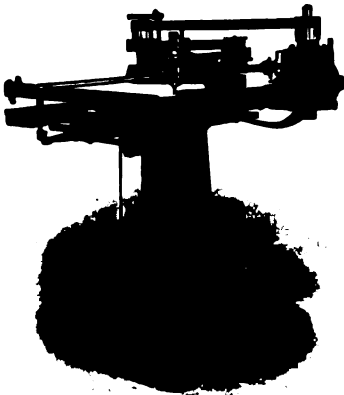


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A TALK ON COMPOSITION

THE moment we commence a picture we begin to compose. This does not mean that we are artists, except possibly in an embryo state. Our compositions, to be lifted toward art, must have in them some of the elements of beauty, thus showing results that emanated from the carrying out of a thoughtful conception of the brain. As we attempt to do this, arriving to a greater or less extent at a beautiful result, then so far do we advance in the direction of art, even if but a step. By the "elements of beauty" we do not mean to imply that our subjects must be beautiful, or that, if decidedly unattractive or even ugly, an artistic result may fail on that account. The beauty in them may be one or other of scores of other things. For instance, it may be the beauty of arrangement, either in the general composition or in special portions, but over and in all there must be unity if the composition is to be really successful. By this beauty of arrangement (for composition is the science of arrangement) is meant not only the pose itself, with the balance of the figure, the

principal lines of beauty in the drapery of the figure, and the movements of its lines, but also of the accessories, the lighting, the shadows, the grouping of the lines of light and dark and other details which enter the picture. Beauty may also consist elsewhere than in the subject or in the arrangement, which, while it may well be composed and satisfactory, may not be the principal object of attraction in the picture. Thus it may consist in the conception in the artist's mind. In looking at his creation we may, for instance, read the life and character of the painter or photographer, as the case may be. The fine sensibilities, the temperament, the character, the aspirations and the grandeur of his own life may all show in part in the work which he produces. One of the greatest delights that we can experience is in realizing this beauty of the conception of the artist. When a man's work thus reflects his mental self, and that mental self is in sympathy with the picture painted on the canvas, the subject in every way supporting and carrying out the same feeling, and if this in turn be

(501)

united with great beauty of conception, well painted, then that piece of work will embody within itself all the elements of a work of art, becoming a masterpiece of the "grand style," as Reynolds terms it.

As an illustration of this, take Whistler's picture of his mother. This is said by the critics to be one of his most successful, if not his greatest work. Those who have seen either the picture or a reproduction will readily recall that it is a horizontal full length sitting portrait of an elderly lady, with both the body and face in profile and placed to the right of the canvas. A study of this will not only show the mother, but the reverence of the son. He knew her best in the simplicity of her life, in the simple house dress that in its style and make was a part of her, because it reflected her taste. When he saw that dress, whether it was worn or new at the time, it became part of her individuality, and was, indeed, part of her. Without that dress the portrait would have been a failure, and the same could be said of the chair she sat in, plain as was her dress, simple as was her quiet life. While looking at this quiet lady sitting in her little chair, we can all appreciate Whistler's feelings: that he wanted the beauty of his mother in every line and wrinkle as they appeared to him. He wanted to express the grandeur of her simple quiet life in the dress and chair that were part of her, in a room that is almost austere because of its plainness and severity. We thus readily see the artist's reverence for his mother and get a true insight to his inner life, being shut out from the world. It shows us a different Whistler than the one we may have conceived during his career, with its struggle for recognition, his intense opposition to his critics, and his final and complete success as one of the greatest of modern artists. This portrait of his mother, which unveils the soul of the artist, is plainly seen by all artists and those who are possessed of ability to read from such things. This chapter may never appear in any sketch of his life, but it is on record, and, like the picture, it will live.

Now, here is an element of beauty that lifts that picture into a work of art.

That is beyond the mere technic of painting or anything at all connected with the breadth, composition, or arrangement of the picture, yet this picture is famous among artists for its beauty of arrangement. So highly appreciated is it that you are most likely to find copies of it in the possession of most portrait painters. We can see how easily the picture could have been spoiled by the addition or removal of even the least thing. Because of its simplicity it will live, while many more elaborate pieces, by equally great artists, will not last even the painter's lifetime, much less bring him fame after his death. It is not only on account of the picture by Whistler, but many similar things in painting and artistic photography, that very frequent allusions will be found in this series of papers to the much repeated recommendations of "simplicity" in your work.

Now, while impressing upon the reader that composition is simply arrangement, and that one of the greatest beauties of arrangement is simplicity, it by no means should be implied that more complex things may not be beautiful in arrangement. This comes only to the genius who is able to handle such things successfully, and can only be grown up to as one's ability increases. At best, the complex arrangement is a difficult proposition to handle. There are other things that enter into composition beside arrangement, or, better still, arrangement or composition may be subdivided under various other heads for our more systematic understanding and absorption.

To quote from a previously written article published elsewhere: "Art is broad, with no very definable or set rules as to what should or should not be done, for in the hands of genius, who know no rules, all things seem to be possible of being done with success." Other artists of lesser light have generally accepted as an unwritten law that certain things are best not done, and that other things look well if done this way or that. For our education we would say that artists of the brush who have spent years in study and have received careful training are our best guides in

art principles. We should never pit ourselves against them as a class, for in the nature of things they are right and we are wrong. We save ourselves trouble and time and get more quickly on the right road by at once recognizing these facts, accepting the situation and ceasing to butt our heads against the brick wall, which does no harm to the wall, while giving us a headache.

As to the extent we may follow them in our treatment with the lens and pictures in monochrome is for us to find out. Suffice to say for the encouragement of photographers as a class, we can go very far—much more than appears at a first glance.

Thinking that a similar view may be held by some of my readers, I would say that an intimate professional friend, who is one of our best technicians, and also possessed of considerable natural and acquired artistic skill, recently remarked, "All the artists can teach us is a few forms of composition, such as pyramidal, angular, circular, etc., and subordination," with which opinion we most emphatically disagree. If this statement had been made by a man of less marked ability, we would not have noticed it; but, as he represents the cultured and able class of our profession, it may be well to consider his remark.

What does the artist produce on his canvas that is impossible to the photographer? Or, better still, what can we do that he does? He employs color; we can only express ourselves in monochrome. He is able to obtain a composite expression that will give the soul showing through the eyes, and paints his conception of the subject's individuality. This is our chief weak point, for with us the consciousness of the sitter is very apparent, and we rarely lose this in the case of an adult, and the photographing to get the subject's individuality, instead of our own, in his picture is our aim and constant study to attain. While recognizing the weakness of our profession in this sense, there are occasions when a fair measure of success is accomplished.

In other respects we can at least be good followers to the pace the artists set us; first in our manipulation, in the

proper selection of lenses as well as the employment of various printing processes, as to the mechanical means, and by securing and producing in our works the art principles which the artists and painters employ. While the lens naturally sees too much, this need not be our utter ruin, as at times we are fain to believe, since it may be overcome.

We can, however, balance our composition by line, spot, or transition of line or spot, by means of light or dark, by secondary objects or interests, with their proper weight of attraction. We can give drawing, perspective, atmosphere, values, and tone. We can produce a suitable background for each model, as does the painter. We can obtain breadth by loss of detail, mystery, suggestiveness, etc. We can have all parts of our pictures hang together; we can give gradation and vibration, and we can give texture. In this last respect we have the means, by proper lighting, of having an advantage to some extent over the painter. We can preserve the planes in their proper relation. We can obtain harmony, which is so difficult with the colors, and we can produce unity. There are a score of things for us all, the only difficulty being to overcome our commercial tendency in producing pictures by the multitude, in comparison to the quantity the painters produce. Our compositions and applications of art principles must need be done with lightning rapidity, compared with the time a painter employs over one picture, and, although his creations from nothing are well worthy of the higher rank given him in comparison with our own means of production, yet the attainment of a position of the greatest artistic success possible with the means at our disposal is a place so high that none of us need for a moment have aught but the greatest ambitions toward reaching that goal which would give us fame, that would not only together with our creations, but would do for art photography that great value in uplifting it in the reverence of the whole human race, that would once and forever set it on a pinnacle as one of the greatest of the arts, there to stay until the end of time.

STUDIO ETHICS¹

By FRANK SCOTT CLARK

IT is a mistake for one photographer to copy another. You should be craftsman enough to create a style entirely your own. It will cost you less and place you at once on a higher plane. You have all the material of the various manufacturers to draw from.

Don't make the mistake of making an overcharge on work not equal to those higher up, as you will lose it through your lack of strength to defend what you did not earn with your own ability.

Half-hatched plans are useless; you'd better throw them out. Thoroughness is the vital thing, the country is full of those who do not achieve what they conceive. Pay strict attention to small details in every department and don't be afraid to take your employee into your confidence, explaining calmly to him his shortcomings, and if he be the right sort and grasps your well-directed effort to help him build up his craftsmanship to a higher degree, he will in turn reciprocate by taking a keener interest and render you the same service with the same spirit of frankness.

A fairly good craftsman will say: "I cannot understand how Mr. S— is able to command the price he is said to receive for pictures." I will say to the profession that we are not all equal, socially, intellectually, or physically. Personality enables one to maintain his higher price with much less difficulty. *A strong personality with calmness of mind, common sense, and a careful exactness of your methods employed in the technical part of your work will enable you to receive just as much as Mr. S— when you have attained his state of perfection.*

A physically weak man can make himself strong by patient and careful training; so the man who is weak in his work can make himself strong by exercising himself in right thinking. Calmness of mind is the result of a long and patient effort of self-control. The calm man can

adapt himself to others; they feel they can rely upon him.

The more tranquil a man the greater his success; he can command a higher price, for he is a better salesman than the nervous, irritable man. Fix your thoughts upon the faultless performance of your duty; you should conceive of a legitimate purpose and accomplish it.

Do not work aimlessly, begin thinking with purpose: having conceived of your purpose you should work out a straight pathway to achievement.

Doubts and fears should be put aside, as they never accomplish anything. Purpose, power to do, and all well-directed thoughts stop when doubt and fear creep in. Remember that nothing comes of nothing, and they who have laid up no materials in their store of knowledge cannot expect much from a brainier, much-travelled, and well-posted picture-buying public. They can oftener do better with their hand cameras and are better pleased with the average post-card than much of the miserably developed paper prints that are delivered as examples of perfect photography.

Photographers are themselves to blame for the condition of their business. So much rotten work has been shoved out of their studios that many people are losing respect for them. There is nothing more beautiful than perfection in the art of photography. Too many workers have been trying to copy the old masters, using as their guide reproductions and such works as *Masters in Art*.

These studies, so black-and-white, are only fit for studies in composition. The originals are soft and have luminous shadows full of beautiful detail. The photographer has copied them literally, making the hands, arms, and backgrounds of his pictures very dark, and, in fact, his pictures are often muddy and dirty.

It requires much skill to so carefully light the figure that the parts subdued will keep their luminous qualities, and

¹ Some remarks before the Photographers' Association of Michigan.

the figure will have, when the print has been completed, its complete envelopment with all its atmospheric qualities. Pictures possessing these ideal qualities are seldom made by our most advanced craftsman. They can be made by much

patience and great skill, and when such great work has been accomplished there can be no such thing as an overcharge. Don't be careless in selecting your material. Deliver your work like a master. Ask and receive a high price.

ARTISTIC LIGHTING

By FELIX RAYMER

THE light side of the face is commonly known to operators as the plain lighting or the portrait light. But the portrait light goes further than one side of the face. When the lighting is once made correctly it will be a portrait lighting from any view of the face. It is not possible to have a lighting that will show perfect gradations, and action, concentration, and accentuation from one point of view and not show the same from any other point of view. If we but once get the lighting on the face right we can move the camera from one position to another, and the light will remain the same, as far as artistic merit goes.

In this article, I intend to pose the subject at the same place in the room, and then continue the movement of the camera, and give directions for making different positions by simply viewing the subject from different points in the room.

I fully understand that there are operators who claim that each face should be lighted for itself, and I will agree to this. But it is an absolute impossibility to light each face just the same. If the operator were to attempt it he would make a failure. There are no two faces that catch the light the same, and the operator will deserve no credit for making them different as he could not do otherwise. The only time I see a necessity for changing the opening in the light is when I want to accentuate some part of the face or figure, and to do this I have to draw down the opaque curtains on my light, as the smaller the opening in the light

the stronger the light and the greater the accentuation on some part of the subject. The larger the opening in the light the more light can enter the room, and the more that gets in the room the further around the subject it will circle, and the further around the subject it goes the flatter it will make the lighting, or softer, as some call it.

Again, I am aware that there are those who claim they never use the opaque curtains, mentioned above, on their light. It is claimed that as good work can be made without them as where they are used. This I do not dispute. But I do deny the assertion that as great a control can be had over light as when the curtains are at hand. If we place a subject under the light and allow it to fall in a flood all around it the result will naturally be very soft and delicate. But do we desire that *all* of our work shall be of the soft, delicate order? Would it not be better to have the light so curtailed that we could control it and get any result that we wish? There are times when we wish to accentuate some parts, or, in other words, show some parts of the composition to be of greater importance than other parts. This is not possible if the light strikes all parts of the face with the same intensity, as it will, of course, make all parts more or less of a flat nature.

I have found, however, that this concentration of light and shade, using the open light, can be more easily managed under the single slant light, or the perpendicular light, than under the old double slant. The reason for this is

that the old double-slant style allows the light to fall into the room further, because it sets in the room further, and doing this it of course falls around on the shadow side of the face further, or rather, should I say, that it diffuses around on that side of the face further, unless the subject is posed quite a little distance from the light. This will, of course, require a larger operating-room than the average studio contains. With the double-slant light I find that it is absolutely necessary that it be curtailed with opaque curtains if the light is to be controlled at all and the room is a narrow one. The principle of the matter is that the further the light falls into the room, or the further it is set into the room, the further from it will the subject have to be posed to secure the right direction, and it will be remembered that the direction of the light as it falls on the subject is of the utmost importance as we consider it in working the light after the directions given in my last article. The one thing that I am asked about almost every day, and sometimes a dozen time a day, and the one thing that seems to agitate the minds of nearly every operator attending the conventions, is summed up in about three questions, and occur in the order given. "What style light do you prefer, single or double slant?" "What size do you think it should be?" "What pitch, or how far should it come into the room?"

All of these questions may be disregarded if the idea is followed of having the light, it matters not what the size, fall on the face from one source and from the right direction.

As to the style of light I prefer, my answer is always that I would as soon have one as the other, if they are of the *same size*. The great trouble with the average workman in deciding in favor of the single-slant light is that he nearly always puts it in smaller than he had the double slants, and in doing this he finds that the negatives made under it will not be as soft and delicate as they were under the double slant, for the reason mentioned above, that the light does not come so far into the room as it did with the double slant, and the lighting is, therefore, of a stronger nature.

Again, it is necessary that we use more front light in working the single slant light in order to obtain the same delicate results. The whole scheme of lighting is made up of using side and top light, falling from the front of the subject. In the case of the double slant light we have the light coming into the room further, and it is not necessary that we use so much front light. It is, of course, essential that the light come from the front, but we do not have to bring it as much from the front as with the double slant. If we do bring it as far front as in the single slant, the excess of front light, in addition to the excess of light falling across the room, will give a flat result. That is why we hear the saying so much that "front light causes flatness." It is because we have used too much front light with the top light which falls across the room and illuminates the shadows. With the single slant light, not having this excess of light falling across the room, as is the case with the double slant, we will have to get our softness in another way, and the only way we can do it is to have the light come in on the subject further from the front. In doing this we make our shadows shorter and thinner, which renders the soft effect desired. But the light will be falling on the subject from the same direction in either case, and that direction will be from a point in the light that will throw all of the shadows in the face downward at an angle of forty-five degrees. Notice the shadows, and if they fall straight downward you are using too much top light. If they are falling across the face horizontally you are using the light too low, or too much side light. In either case there are but two remedies: One to shift the curtains until the shadows take the proper direction, the other to move the subject further out into the room or nearer the light, as the case requires.

There is one thing that can be borne in mind to assist one in determining the right direction quickly, and that is the larger the source of light used the further from it the subject must be posed to get it falling on the face from the right direction. Of course, the smaller the source the nearer the light the subject

will have to come, as, for example, when using a window, it will be found that the subject will have to be posed within three or four feet of the light in order to get it falling on the face from the right direction. Of course, in the large double slant we will have to be much further from it or use curtains, which will simply be another way of making a smaller opening.

Therefore, to sum it all up, we find that there is no difference in the lights, if we have a knowledge of what a lighting should be. We can make the lighting under one as easily as the other, after we know what it takes to make an artistic lighting.

The second question is, "What size do you think it should be?"

It does not matter a particle what the size of the light may be. As good work can be made under one as the other. But it will be of a different class. As, for example, I stated above that with a large source of light a softer effect will be secured than with a small source. There is the answer to the second question. If you prefer snappy, crisp results, with certain parts accentuated, and rich shadows, they can be better obtained with a small light. Bear in mind that the smaller the source of light the stronger will be the effect in the lighting. It will thus be seen that a stronger effect is possible by the use of a window than would be the case with a light measuring eight feet wide. Although it is possible to secure just as soft results with the window as with any other source, to do it we will have to use either a reflector on the shadow side of the face to bring out detail, or the head-screen on the light side of the face to tone down the high-lights. In doing either of these we are using an outside agency, so to speak, to overcome a condition. If we use the reflector on the shadow side of the head we will not need the head-screen. If we use the head-screen we will not need the reflector. Some say they do not like to use the reflector, but prefer to use the head-screen, claiming that the reflector destroys modelling. Others claim they do not like the head-screen, but prefer the reflector, claiming that the head-screen destroys the brilliancy of the high-

lights. As for my own use, I at times find that the head-screen is advantageous, especially where the subject has an oily skin, which will throw back the light, giving rather a marble appearance to it. The head-screen softens this down. At other times I find the reflector better, and this occurs where the subject has a flesh that is dry and parchment-like. In this case I desire to raise certain parts of the face above others, and if I were to use the head-screen I would be flattening the whole face out worse than it was in nature. With the reflector I can use just enough to illuminate the shadows and still preserve the high-lights.

After close inquiry I find that those preferring the head-screen and advocating the idea of doing away with the reflector are those who are using the single slant light.

The reason for this is as above mentioned, that it is necessary to face the subject further toward the light, or, in other words, that more front light be used when working the single slant light. Less reflected light will consequently be needed to illuminate the shadows. All that is necessary is to place the white head-screen over the head, and the trick is done.

My experience shows that it is well to ascertain what kind of a light a man is using when he advocates any certain way of working it. The men who use the single slant work differently from those using the double slant. But in all cases we should be working for the same *results*. And the only way in which we can secure the same results is to have the same results to secure. To do this there must be some way that is the right way.

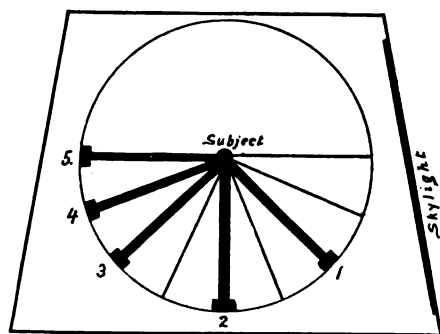
The third question is, "What pitch, or how far should the light fall into the room?"

It does not matter. I would as soon have the light standing perpendicularly in the room as to have it drop in. While I have said that it does not matter as to the size of the light, I prefer one of goodly dimensions, for the reason that I can, by having it curtained, get any effect of light desired, from one of a very soft, delicate nature to one of extreme snap and contrast. This would not be

possible if the light was a small one, for it would only give what its size was capable of giving, unless we used the head-screen or the reflector as mentioned above.

For this reason, I say, it does not matter whether the light is a perpendicular, single slant, or a double slant light. The effect of the lightings made under them should be the same, and will be the same if the operator knows what it takes to make up a good piece of work. The key to the whole situation rests in the direction of the light. When the right direction of light has been secured the effect will be the same, it matters not under what style light it was made. Again, there is but one direction of light that will look the same from all sides or points of view, and that is a direction that is neutral, so to speak. In other words, one that is neither from the top nor the side, but a point half-way between the two extreme points.

I call the reader's attention to the drawing, which shows the positions of the camera and the posing of the subject. It will be noticed that I have



made a circle with the camera around the subject, using the subject as a pivot. After the lighting was obtained from the position of the camera marked No. 1

there was no change made in the posing of the subject. The only change made was the moving of the camera from one point to another. In my last article I told of making the lighting from the light side of the subject, and in making it the camera was in all cases, except the front view of the face, nearer the light than the subject. But in this diagram, and in making these views of the face, the camera will be placed on the other side of the subject, and consequently farther away from the light than the subject.

I will give the directions for making one position on the light side of the face so that it will assist the reader in understanding the shadow side. The camera was placed at No. 1 and the subject posed at a point in the room where the light would fall on it from the right direction. Then the face, if turned toward the camera until the ear on the shadow side of the face just fails to show, will give a three-quarter view. From this time on it will not be necessary to change the subject at all. Move the camera to No. 2, and a full front view of the face will be the result, and the light will be as good as in the former position. Now, if the camera is moved to No. 3 we will have what operators have called the Rembrandt lighting and a three-quarter view of the face in that lighting. If we move to No. 4 we have a view of the face that will allow the nose to just pass the outline of the cheek, and it is a good view of the face sometimes, especially where the subject has rather hollow cheeks and high cheekbones. The nose breaking across this outline will very much improve the effect. No. 5 shows a full Rembrandt profile, the subject not being moved in any way. In a subsequent article I will show half-tone illustrations and further demonstrate my views on artistic lighting.



BY FREDERICK POHLE

BUFFALO, N. Y.

THE WORK OF FREDERICK POHLE

By SIDNEY ALLAN

"THE chances for a photographer in Buffalo must be exceptionally good," I heard some member of the brotherhood remark as he passed through the Queen City. "It is one of the largest and richest towns and there seem to be less galleries than in most places." Yes, the percentage is small, about thirty-four—one photographer to every thirteen to fourteen thousand inhabitants—still there does not seem to be room for many more. Exceptionally it might contain the necessary leaven of truth, but from all I hear the path of the practitioner is not exactly paved with gold ore. It is apparently very difficult to raise the price.

The trouble is that Buffalo is a very peculiar town artistically. The art situation—well, there is really none. It is largely represented by the Albright Art Gallery, which is excellently conducted, and which, like a regular showhouse, holds several attractive exhibitions every

season. But there is little local patronage; there is not *even* a single art store. Much smaller towns—for instance, Milwaukee—have two or three art shops with real paintings and regular art exhibitions, while Buffalo has only a few art-print and framing stores. So the art buying must be done somewhere else. And as it is in art it is in photography. Buffalo has no "one leading photographer," like Strauss of St. Louis, or Stein of Milwaukee. Buffalo society is apt to patronize the photographers of other towns, not fully realizing that they could get just as good work at home. It is merely a whim with them. Perhaps nobody has asserted himself sufficiently to correct this erroneous opinion.

The standard of work is unusually high. Each man has more or less his specialty. Beach makes the society appeal. Sipprell, with his autochromes and pictorial prints, tries to satisfy the more fastidious. Peck and Burnell are home portraitists. Nussbaumer

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scores heavily with lodges and fraternities. Hubert Brothers reign supreme in the Grand Avenue district, even as Zabawski in the Polish quarter. Besides there are Bliss, Titus, Kramer, McGeorge, all skilled and serious craftsmen, making the best of conditions.

But there is one gallery that caters to all classes of society. It is Frederick Pohle's establishment, one of the best-known galleries in town.

Pohle has been longer in business than most of the boys. He has grown up with the town and has always known the art of keeping his name before the public. His gallery is spacious and clients can wait there for a sitting without being inconvenienced, and it is so centrally located, just a door of Main Street, that it appeals equally to business men, pleasure-seekers, and ladies on their shopping expeditions. It seems as if some time or other everybody must stray to his place.

Pohle is truly popular, and the excellence of his work recommends him to all newcomers. "My policy," as he puts it, "is that everybody must leave the place satisfied. If they don't like the proofs not a word more is said about them. Into the paper-basket they go, and I am ready to do the work over again."

Anybody who wants a faithful likeness, a good picture, a resemblance that is a pleasure to give away to friends, will do well to go to Pohle's. So many photographers nowadays indulge in special styles and unusual effects, and forget that, after all, the most desired article is a portrait that has the real familiar resemblance to the original. With a stream of customers continually coming and going—no matter how he gets them, as long as he gets them in a legitimate way—one cannot afford to make portraits that will be condemned and rejected because they fail to be recognized as *fac similes* of the sitter. Pohle has made a very careful study of the necessary means to be employed in obtaining the faithful likeness. He believes in the play of features, expression as the vivifying element, and favors speedy exposures that record an animated countenance.

A successful portrait, of course, deals

with many other qualities than the mere face. Nobody realizes more keenly than Pohle that a pictorial effect or a harmonious scheme of lighting are indispensable, but he never subordinates a characteristic likeness to artistic conceptions, for, after all, the majority of patrons, no matter from what ranks of society they are recruited, prefer a normal representation of themselves and their friends to any ideal portraits however beautiful. Pohle has always been a student of art and he is a all-round technician. He is at home in every branch of the profession, and takes a church interior with same ease and skill as an outdoor group. And in the same way he knows how to handle texture and color of dress and drapery, as seen in some of the accompanying illustrations. Some of the drapery effects show masterly handling. As much as he believes in a natural expression of the face, he does not encourage instantaneousness of pose but endeavors to control the arrangement. The character of light, the height from the floor, the figure composition, the fall of the garments, the pose of the hands, are all deliberately considered. No extreme artistic aims, but a sufficient amount to bring out the best that is in each sitter pictorially.

Rarely did I find a photographer more passionately, more enthusiastically in love with his vocation; rarely does anyone spare himself less. He never falls into slipshod methods, but always advances the argument, "As long as I make a picture, why not make a good one." He is not satisfied with representing his sitters with their ordinary characteristic traits and in their usual attitudes, but strives to bring out their peculiarities and hidden beauty, seeking dominating lines, broad effects, splendid effects of contrast, clear outlines, well-balanced poses, and his prolonged observations, his familiar acquaintance with the manners, characters and ways of customers enable him to amalgamate the natural and the ideal to a considerable degree.

Looking over his prints, we are astonished at the even average of excellence. Why, there are hardly any errors of composition. Every picture has its



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BUFFALO, N. Y.





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merits. They look as if they were as perfect of its kind as circumstances permitted to make them. They all have a pleasing and finished look about them. You may admire the composition so cleverly handled in one print, the relation of tones in another, the decorative feeling in the drapery or the truthfulness of a pose, the lovely female heads and the convincing interpretation of character in the portraits. A gallery of

reliable, sympathetic and intelligent portrayals, made apparently with prodigious facility, for it can hardly be said that the illustrations were specially selected. There were hundreds more and all of the same sincere and exceptional quality. And what is to be admired most is that all these qualities are contributory to the chief aim of the photographer, to the securing of a faithful likeness.

A FEW IMPORTANT POINTS IN COMMERCIAL PHOTOGRAPHY

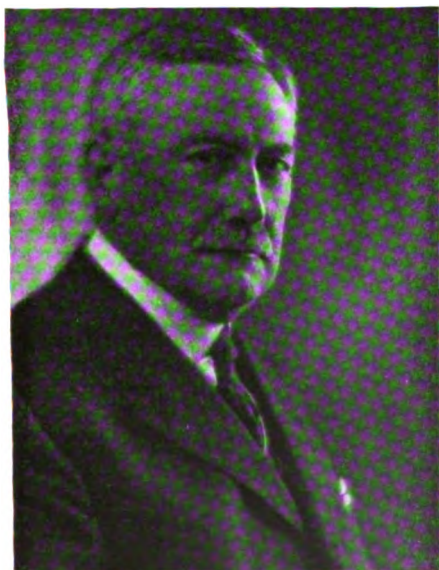
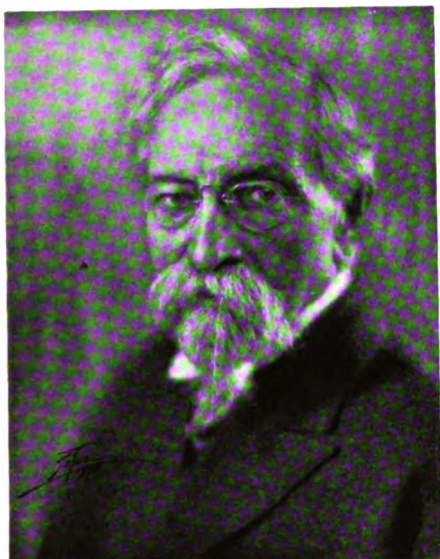
By W. J. SMITH

THE increasing demand for photographic illustrations to assist in the buying or selling of commercial articles is very apparent, and as the demand increases so must there be a corresponding demand for specially trained workers. The training necessary to become a really successful operator should embody an organized course of study, so that all working conditions can be as far as possible "standardized." Standardization is a most important consideration in modern work and is the outcome of study coupled with observation, commonsense and adaptability. The principles that govern the work of a commercial photographer are a mixture of science, art and business capacity.

Should the worker himself have to obtain his customers, he must realize the fact that when dealing with a man of business time represents money, therefore be brief, but well to the point, exercise tact (not bounce) and try and adapt yourself to the mannerism of each customer. The commercial client usually requires quite a different class of reproduction from the artistic one: the former, like the general public, appreciates bright, telling results that show the selling qualities of his goods; the artistic client appreciating photographs that are full of gradation, softness, and show

all artistic value the original possesses. "Advertisement is the life of commercialism," therefore the advertising side of the department must receive careful consideration, and tastefully mounted specimens of the different qualities of work should be displayed so as to command attention. The artistic principles are applied when arranging the articles to be photographed. See that the point of view and lighting are adjusted so as to display them to the best advantage. The combined artistic and scientific principles must be used when selecting and determining the focus of lens to be employed for a given subject. Undoubtedly the best and most pleasing photographs are those taken with long-focus lenses, 12 in. on a $\frac{1}{2}$ -plate, 16 in. to 18 in. on a 1/1-plate; this especially applies when reproducing objects of a round nature and where there is considerable modelling. Short-focus lenses flatten out modelling and roundness, and elongate objects near the edge of the plate; but sometimes it is necessary to use them, therefore the point of view must be arranged so as to minimize as much as possible any distortion they appear to give.

Long-focus lenses of the anastigmat type are expensive, but the greater speed obtained when exposing and the higher quality negatives soon repay the



BY FREDERICK POHLE
BUFFALO, N. Y.



original outlay. Many photographers who possess a good modern lens still adhere to the old-fashioned method of using small stops ($f/4.5$ or 6.4); the lens, however, would work quite as well and even better at $f/16$ or $f/22$, with an economy of exposure. In the pre-anastigmat days it was necessary to stop down to eliminate the defects from which the lenses suffered; this ancient habit still attaches itself to some present-day photographers, although they possess a modern lens of first-class quality. Stop down to secure depth of focus, this often being obtained at $f/16$ with an anastigmat working at $f/6$. Cinematograph pictures are good examples of what excellent work can be produced by using large stops.

In object work photography, such as the reproduction of articles for catalogue illustrations, the lighting must be carefully adjusted to show the quality or texture of the original. The difference between an ordinary piece of calico and silk is the texture, and this must be indicated in the reproduction. The difference between an ordinary picture and one by a gifted artist is the quality the genius of the artist has enabled him to impart to the picture, and the successful commercial photographer will be the one who recognizes what essential points his photographs must show. The various varieties of dry plates and printing papers should be studied in order that they may be intelligently selected for the work in hand; this latter remark especially applies to color-sensitive plates and filters. The ignorance displayed in this direction is very noticeable, also in the selection of the developer and in the subsequent development. Standardize all negatives so that they are the correct contrast for the printing processes employed and the right density for the light source used. This is a very important point to remember, especially when a considerable number of prints are required. The pyro developer is undoubtedly the most economical and best developer for the general run of commercial work, as the deposit of silver given is very light-resisting. The nega-

tives must not, however, be over-developed, but kept on the thin side, which will enable prints to be obtained very quickly. For black-and-white copying and where extreme density and contrast are required, hydroquinone is to be preferred, but this developer is very sensitive to changes of temperature and will almost refuse to work below 57° F. This latter fact should be remembered when metol-hydroquinone is employed for bromide paper or plate development, as metol will work at a much lower temperature than hydroquinone, the result being negatives of no printing value or prints of a weak gray color. Glycin is a developer that deserves more attention, being particularly useful when making color negatives, provided the exposures have been full and the temperature of working room above 60° F. The temperature of the dark-room is a very important point, and if development is to be standardized must be about 60° F.

A thermometer is as necessary to consult before development as an actinometer before exposure. Regard the latitude of the plate as divided into three parts—short exposure, normal exposure and full exposure. For example, short exposure on flat subjects, or when working against a soft light, and forced development will frequently produce a bright negative. Normal exposure and varying times of development will flatten or brighten contrast. Full exposure gives different densities according to the time of development. Short development will give soft negatives from contrasty subjects. Subjects that are likely to show halation will come under the third division, but development must be curtailed.

All these items have to be considered before it is possible to standardize them, and they can only be intelligently worked after careful study and application. Remember, the more knowledge acquired by systematic study, coupled with the power to deduce from that knowledge, and skilfully applied in practice, constitutes the stock-in trade of a clever workman.—*Penrose Pictorial Annual*.



BY FREDERICK POHLE
BUFFALO, N. Y.



A FEW REMARKS ON SHOW-CASES

THE show-case is, no doubt, the safest and most appropriate vehicle of advertising a photographic studio. It attracts the attention of every passer-by, and, if by chance your own portrait should be in a week or so, you will be astonished how many people, even perfect strangers that you meet casually, will tell you that they have seen it and recognized you.

The argument that too many show-cases in one block are valueless, that one interferes with the other, and in that way fails to produce the desired impression, is paradoxical. A show-case, no matter how many others may be in its immediate vicinity, is an isolated object, and if attractively arranged will draw its share of attention. It is a legitimate competition, and the photographer who is most skilful in his display will win out.

Photographers ordinarily do not bestow enough care and attention upon their show-cases. Many of them look slipshod, neglected, and even ridiculous. There are a few fundamental rules to go by, and it is the object of this article to discuss them. There are four propositions to consider: (1) the construction of the case, notably its dimensions; (2) the placing of the same; (3) the interior arrangement; and (4) the display of the prints.

The construction of the case is naturally influenced by the available space. Lack of space has produced a decrease in size. Cases 80 x 100 inches are rarely seen in these days of exorbitant rents, and they really represent little more than a waste of space. They do not concentrate the attention. Fig. 1 is supposed to be 80 inches high. The distance from the street level to the lower edge is about 28 inches—the height of an ordinary table. The ordinary eye level is about 60 to 62 inches, and the eyes of the average beholder would strike the case at the line indicated by the arrow, about 32 inches above the lower edge. The normal vision would be attracted only by the lower row of prints. (The oblong at the bottom is supposed to contain the

name of the firm.) To appreciate the third row, the beholder had to step back and crane his neck; the upper rows would produce no effect at all; and if the beholder should be shortsighted, even the lowest row would necessitate close scrutiny.

The moral of this argument is, that cases in this order are bad advertising mediums. If the prints cannot be seen, what is the use of exhibiting them?

Fig. 2 shows a better arrangement. One large print would attract immediate attention. Another way would be to hang four medium-sized prints as shown in Fig. 3. It is at least a more pleasant arrangement, even if the upper two hang too high.

An ideal arrangement is that of Fig. 4. This case is supposed to be an oblong of the dimensions 10 x 7. The beholder can see at one glance all the various exhibits. They make an even, agreeable impression, and do not look topheavy, as the display in Fig. 1.

A wooden case with a plain iron frame is most recommendable. Iron can easily be colored by ordinary paint. This will protect the ironwork from getting rusty. They will wear and look well. Black, gray, and brown are probably the most suitable colors; but this depends much on the surroundings.

The illustration given represents such a case. It shows good taste, and as it is one of the most effective ways to make the gallery owner known to the general public, he should be very anxious to create such an impression. It reflects in a way the quality of his work.

The framework of show-cases should never be of polished brass or loudly colored, as it is not the exterior of the case, but its contents, that should attract immediate attention. Bronze, on the other hand, is a dignified material, and will show up to good advantage. Unnecessary ornaments resembling a frame, as in Fig. 5, should be avoided. A show-case is a frame in itself, and any elaborate effect will detract from the prints.

Figs. 6 and 7 show the display of a



BY FREDERICK POHLE
BUFFALO, N. Y.

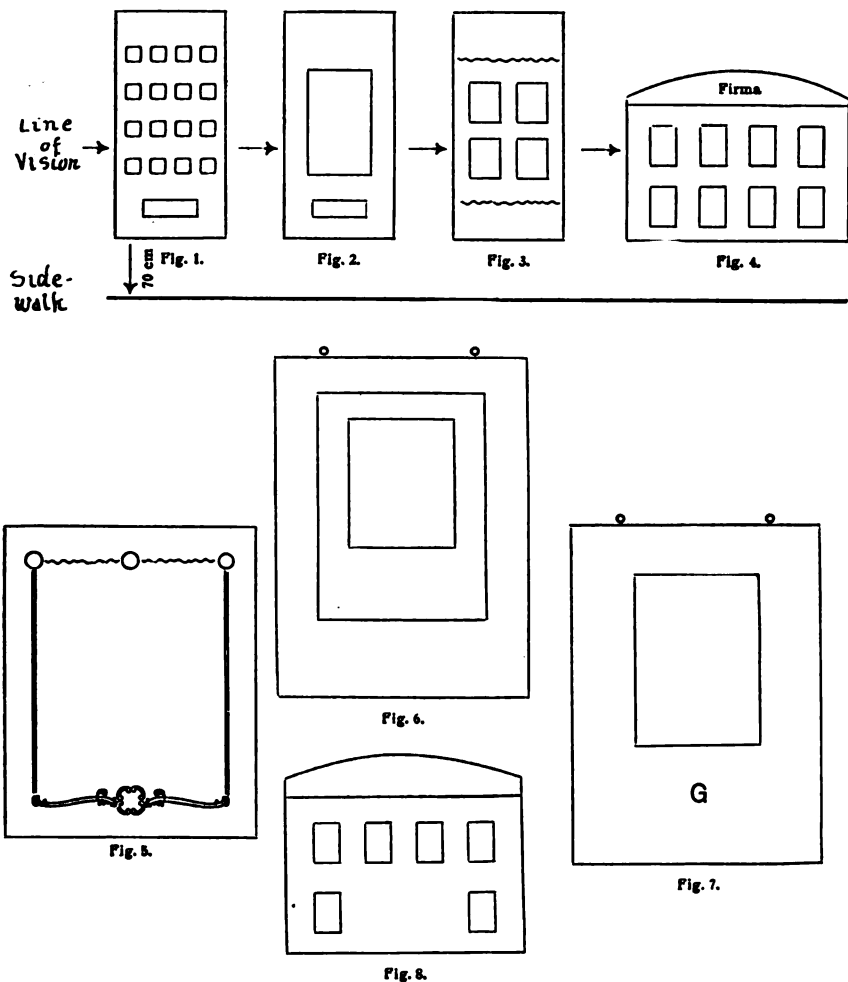


single frame in a small case. The letter *G* indicates the position of the monogram or name of the firm.

In these days of electricity, many photographers make a display of their wares at night. The simplest method of illumination will always be the best. The source of light should not be seen, or arranged in a simple, artistic manner

But buckram in light and delicate tones seems to be the most plausible and least expensive of all backgrounds.

The background, of course, must form a harmony with the color of the prints. With dark prints the background should be dark, but a trifle lighter. With light prints the background should always be a trifle darker.



by an electric light bulb of agreeable shape in handsome, unobtrusive fixtures.

The empty interior must be in perfect harmony with the exterior. A white case cannot be furnished with pink or green plush. Velvet and plush are not in good taste. Materials reproducing gobelin patterns may look attractive.

The arrangement of the prints should be simple. A straight arrangement, as in Fig. 8, is better than a circular one. It is not absolutely necessary that the prints be of uniform size, but a mixture of framed and unframed prints, miniatures, etc., should be avoided. The color of the different prints should not

differ, as it would spoil the tonality of the general effect.

These are some of the rules that every photographer should follow. It is necessary that *the case should make a*

clear and cheerful appearance, and that the exhibits should be changed frequently—every week, or even twice a week (in smaller towns)—to keep up the interest of the regular passer-by.

THE CLOTHES IN THE PICTURE

By F. STANARD

“DO women come to you to have their dresses photographed?” I smiled when this innocent question was put to me, for I consider a new dress one of the best friends of the photographer.

Those of my customers to whom an extra dollar is an object, and who come for \$3 work, invariably come in their best dresses. Those who order a dozen prints, supported on the latest thing in mounts, invariably choose the time when they have just received a new dress. Yes, the new dress helps the photographer's receipts.

I am not one of those dyspeptic mortals who wail over imaginary evils in my profession. Occasionally I make suggestions as to dress, especially when appointments are being arranged for children. I keep a number of specimen prints teaching by contrast, and I point my moral by indirect suggestion rather than direct fire. (Tact is a very necessary factor to the photographer.) One selection shows children dressed in aggressive “Sunday best” contrasted with children in some soft, light-tinted,

simply made garment. Another contrasts the unity of a soft gown and little jewelry with a stiff waist and overabundance of decoration. But I only make these suggestions where I think they will be appreciated. It is no good talking of lines or composition to the girl who wants a photograph of the miniature in her brooch and of her engagement ring.

After all, what we are after in photography are facial likeness and a suggestion of character. And the former is the more important from a business point of view. Sitters usually come in the clothes they like, and now that we are so much emancipated from the old difficulties of incorrect renderings of color values there is no need to more than suggest any preferable style. It is the photographer's province to make the best portrayal of what is put before him and if he does this to the best of his experience and ability he will find that the question of what is the best dress for artistic effect is one having only an academic interest.

BOILED water when cold is nearly as good as distilled water.

WEAK sulphurous acid will remove stains caused by amidol developers.

SULPHITE of soda in the developer preserves it and prevents the film from staining.

AN even temperature of about 70 degrees is most suitable for chemicals and dark-rooms.

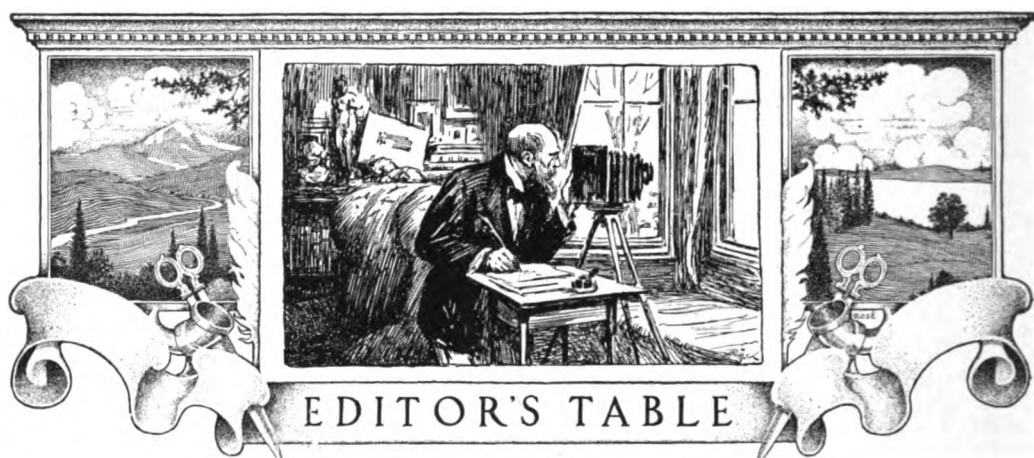
ALL chemicals will act with considerably more vigor when warm than when cold.

GELATINO-CHLORIDE prints always dry a shade darker in tone than they appear when wet.

HYP0 can be quickly dissolved by tying the desired quantity in a piece of muslin and suspending it half-way down in a jug of water.

RUBY glass chimneys are said to be unsafe when they have been in use a considerable time.

AMIDOL does not keep well in solution, eikonogen only a short time, hydroquinone and metol keep well.



IN THE RIGHT DIRECTION

TO those who are keeping a close watch upon developments along photographic lines there is noticeable a strong undercurrent in the direction of specialization that is important to all concerned.

This feature is perhaps most prominently visible in the many studios that have within the past few years extended their lines outside the studio and have made direct bids for portraiture in the homes of their patrons. Some may, as they do, characterize this as a fad and laugh it to scorn on the ground that it has no interest for them. If such there be, they are destined, we believe, to a rude awakening within the next few years, for the indications multiply that the people of our larger cities and towns who are possessed of attractive homes are showing a decided tendency to cultivate the practice of being photographed in them instead of in the studio, which is foreign to them in every way and distasteful in many. There are many reasons why men and women of social position have welcomed this innovation. They are waited upon in their homes by the photographer, rather than being compelled to wait upon him at his studio. This in many cases carries the greatest imaginable weight. Then, too, they are pictured amid the home surroundings that are familiar to their associates and among which they are wholly free from

constraint. They may be attended by their own maids or valets and every condition is favorable to ensuring a good likeness.

Time was, of course, when the making of satisfactory negatives under the various light conditions that must be encountered in this work would have been impossible, but that objection no longer is an unsurmountable one. With the improved facilities for rapid work which have attended the perfection of lenses and plates, and also by virtue of artificial light, exposures are today being made possible which years ago would have been out of the question. With these facilities for rapid work a number of ambitious men—and it may be said in passing that they are in the main young men—are making a specialty of "at home" portraiture. Many of them are meeting with the most gratifying success and are finding their field a profitable one to cultivate. Prices are made to cover an ample number of plates and to include all the time necessary to the extra-arduous work involved. The pocketbook of the sitter is, in such cases, usually equal to a goodly pressure, provided the work is of the right quality. It is easy under these conditions to see why the proposition finds favor with both the sitter and the photographer.

There is no occasion for those who confine their work to the studio to fear that the "at home" man will ever do it all, but it is an absolute certainty that

he is going to do more rather than less as the years go by.

It must be remembered always that work of this kind requires the most proficient knowledge of every step in the process. There is no familiar light to give the same results under given conditions every time. The photographer must work out each problem for himself without a chance to experiment. He must be so proficient as to gauge his conditions subconsciously and be ready to expose his plate with a knowledge that it will be developable into a negative. He must know the rules of good composition, for he is dealing with people who are likely to have artistic taste and training above the average. He must have a social training that will enable him to avoid awkward breaks and that will alone give him a sense of freedom from constraint. When these several points are considered, it is apparent that work along these lines is worth good prices.

It is specialization, and the work of all specialists has a value beyond that of the ordinary workman.

Photography of this kind can find a market and command its price. It is gratifying to note that so many workmen are turning their attention to it year by year. All such enterprise raises photography in the popular esteem and gives to it a dignity beyond that usually considered its due.

OUR GREETING AND MESSAGE

THERE is a minor in the carol this Christmas season, and it is not easy to think of "Peace on Earth, goodwill toward men," with the accustomed inspirational joy, so that to each one of us Christmas Day, 1917, should be a time rather of re-dedication and re-consecration to the cause of universal freedom and humanity than selfish indulgence. And every man of us should realize more fully what President Wilson so strongly expressed when he said: "The day has come when America is privileged to spend her blood and her might for the principles that gave her birth and happiness and the peace which she has treasured."

We must be prepared, therefore, each of us, to make infinite sacrifices if need be to secure this glorious result. Then in our own various individual pursuits—many of us taxed to the utmost—we must each be more resourceful. That is one of the great lessons we must learn in these trying times, and as some one has so well said: "The great highroad of human welfare lies along the old highway of steadfast well-doing; and they who are the most persistent and work in the truest spirit will invariably be the most successful; success travels on the heels of every right effort."

The year 1917, in spite of war conditions, rising prices and scarcity of help, has been on the whole an unusually prosperous one for the American photographer.

Speaking broadly, for the most part the photographer has been able to enjoy his work day by day; has found his patrons ready to appreciate his best efforts and pay for them; has added to his bank balance, and has bettered his standing in his community. Let him be thankful for that!

In the work of the JOURNAL during 1917 it has been our continual endeavor to help our readers to take advantage of their wonderful opportunities. To the best of our knowledge this JOURNAL has given its subscribers more useful information and more practical instruction than any other journal published for photographers. A glance over the contents and index published with this number will show the variety of the subjects dealt with, their direct relation to the daily work of the photographer, and their value to him as a business man. The labor and expense involved in the work has taxed our resources severely. We have liberally shared our profits with our readers. Now, that the year's work is ended, we make bold to ask our readers to sum up the results of their investment with us and give us a prompt verdict.

If the JOURNAL has brought you pleasure and profit, see that the renewal of your subscription is sent promptly. If the JOURNAL has deserved your goodwill and support, give us the good-will in the shape of a new subscription. A

very little effort will accomplish this good work and strengthen our hands and yours for 1918.

CHARGE BY THE PRINT

IT is true, of course, that many photographers can and do charge "by the print," but they are still the exception to the "price per dozen" rule which has prevailed in professional photography from the beginning.

Professional photographers with any ambition at all are anxious to have themselves and their profession taken more seriously. One method that will go a long way toward gaining additional respect is to come out of the huckster class and talk and quote prints individually. A dozen or two of this size and a dozen of that size savors somewhat of the wholesale. The individual print should be the talking-point. Talk about prints by the dozen and your client conjures up a vision of an assistant turning a crank and producing prints like a machine turning out visiting cards while you wait.

It is quite true that this is exactly what does take place in postcard printing. For the class of people that want postcard portraits that is about the way they want them. They buy them by the dozen, stick a stamp on them and consign them to the tender mercies of the post-office.

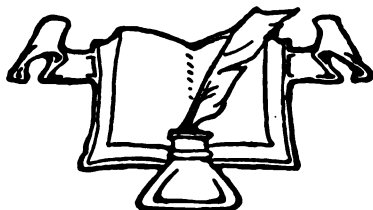
But with the vast army of well-to-do, intelligent people a more artistic

method will appeal more to their sense of the fitness of things.

A satisfactory and pleasing picture is what you strive to produce. It is not made more satisfactory by being reproduced six, twelve, or a hundred times. *Unless you satisfy and please your siller you are not going to be satisfied yourself.* When the satisfactory print is produced it is valued at whatever your price may be. It is then up to your customer to decide how much they are prepared to spend on duplicates for their friends and relatives. The price sounds very much less formidable by the single print than by the dozen, and human nature is such that the individual who would balk at paying thirty-five dollars or more for a dozen photographs at one order would spend considerably more if left to order one or two at five or ten dollars per print, with gradation scale for others.

To take care of those particularly mean people, and fortunately they are few, who would not order beyond the initial print a suggestion of a foundation order of three prints from a negative could be acted upon. This rule could be urged at the discretion of the receptionist.

For special purposes, where a large number of prints are required, a special price would have to be made on the quantity basis; but many photographers who are selling photographs by the dozen could sell by the print and increase their bank accounts and their standing in the community.





PRACTICAL PAPERS ON STUDIO WORK AND METHODS

Reception-room Specimens

PROFESSIONAL photographers may be divided into two classes—those who, studying closely the reception-room, know the business value of good specimens, and those who, giving the matter scant attention, allow things to drift haphazard. It is really surprising what a number of men there are who will use every available means of bringing possible customers to their studios, and who at the same time neglect to arrange that their samples shall produce a good business impression, and bring in the best possible order from every visitor.

The high-class studio, perhaps, errs least in this respect, probably because a good receptionist is regarded as an essential, and the business aspect of the specimen is naturally one of her first cases. The cheap postcard studio, on the other hand, has little or no need for specimens; a window display is usually sufficient. But among the host of middle-class photographers it is the rule rather than the exception to find a lack of system in dealing with possible customers. There may be some excuse for the harassed possessor of a small business, whose time is taken up principally with workroom affairs, and who is inclined to shirk the periodic task of overhauling and renewing his specimens; but surely it needs no argument to drive home the absolute necessity for dealing with customers in a business way—a way which shows that the photographer is not merely an artist but also that he is alive to present-day requirements, and can understand and produce exactly what is wanted.

Some of the methods adopted for maintaining and arranging the supply of specimens are so haphazard that they scarcely deserve the name. Frequently on entering the premises one finds piles of photographs on tables, etc., sometimes carefully stacked, often lying in confusion. A closer inspection shows a series of mounts exhibiting a varying degree of dirt and finger markings, and the photographs themselves, although perhaps individually good, are usually a mixture of up-to-date pictures together with the fashions of two and three years ago; ladies in winter furs

showing during the summer, and so on. Comment on this state of things is needless.

Sometimes one finds that, with a view to keeping the prints clean, specimens are kept in drawers, and brought out by the handful when required. But the handling is in no way reduced, for usually it is necessary to hunt through grosses of babies if one wants a three-quarter figure of a man, and the mounts keep clean but little longer. The method of renewing is oftentimes on the same level. In some businesses chance overprints, added at intervals, form the sole source of supply. In others, especially where the photographer has some pride in his work, an extra print is carefully made from anything especially "nice," and added to the collection. And generally, when new designs in mounts are bought, prints are chosen for them from any work which happens to be in hand, and the new mounts, being the only really clean ones in the lot, naturally sell first, while the older stock hangs fire.

What other tradesman would think of keeping his stock in such a condition? No man would go twice to a shop where, when he asked for neckties, the assistant hunted through drawers filled with socks or braces before finding a few soiled examples of what was asked for. Why should the photographer alone remain years behind his competitors in other trades? The appearance of neglect, and the waste of the customer's time while fumbling with pictures of the kind that are *not* wanted, cannot fail to add to that distaste for a visit to the photographer which is so often experienced, particularly among men.

Every tradesman arranges his stock methodically, so that he can show immediately the class of goods required. Why are photographers slow to do likewise? There is a difference, of course, between the retailer and the man who makes pictures to order, but in the mind of the customer this difference is practically non-existent. What arrangement is advisable is, of course, a matter which must depend on the peculiarities of each individual business, but in any case there should be included some system by which worked-out specimens can be periodically removed and replaced by new.

How best to do this depends, as said before, on the needs of each particular business, and in

SINGLE FIGURES

Sub-headings may, of course, be omitted, but their use as above entails very little extra work, and ensures a fair proportion of different positions being included in each set.

Next comes the manner of storing. If sufficient large drawers are available they may well be used, the specimens for each class of sitter having its own drawer. Such receptacles, however, are usually shallow, and the mounts have consequently to be laid flat on each other, causing much unnecessary rubbing. Also experience teaches us that whatever is wanted from a drawer is always at the bottom, and it is practically certain at any rate that the whole lot will be lifted out in nine cases out of ten, thus giving the customer the opportunity of seeing any inferior styles which the receptionist might have wished to keep back. I find that a much better plan is to make use of the ordinary office "transfer cases." These can be obtained in various dimensions, and should be chosen sufficiently large to take all ordinary specimens. Those which I am

using are strongly made of pasteboard, with wooden ends, and being neatly covered with dark green leatherette are not at all obtrusive in appearance. Their shape permits the mounts to stand on edge, so that they are subjected to a minimum of rubbing and rough handling, and the hinged side of the case enables any particular style to be selected and produced immediately.

Where the work varies much in price—as with bromides and plats., for example—it may be found advisable to employ two sets of cases. By this means the mixing of high and low-priced work can be entirely avoided, as well as much time saved in showing specimens.

Since I have adopted this methodical plan I have fully satisfied myself as to its advantages. Undoubtedly much valuable time is saved in the reception-room and the business of dealing with probable customers is much simplified. Better still, it produces a good business impression on inquirers, who appreciate being shown immediately clean and attractive pictures of the kind they wish to see. And last (but probably most important) of all, it gives a tactful receptionist the means of securing enhanced orders by enabling her always to produce just the right thing at just the right moment.—GEO. F. GREENFIELD, in *British Journal of Photography*.

Help

FOR the holiday trade it will probably be impossible to get extra efficient help in the studio, and every photographer should begin to consider ways and means of taking care of his business on the "one-man" principle. Many young men have joined the colors, and quite a number of skilled photographers have joined the various organizations where photography is an essential part of the service. The demands of the government are growing greater, and efforts are being made to enlist the services of more men. All of this presages a shortage of skilled help so long as the war lasts.

However, there is a very promising phase of the situation, and that is the fact that the government is training a large number of young men who have either had but a superficial knowledge of the science of photography or none at all. They are going to need expert workmen, and will be compelled to create a large number of them, and while most of them will be trained along those lines that will fit the requirements of war work, the education will fit them for adapting their knowledge and experience to regular commercial lines after the war is over. Therefore, it would appear that there will be available a large quantity of very capable and active help when these men are again turned back to civilian life and again take up their work of earning a livelihood.

In order to accomplish the work of the studio with the limited amount of help available, it will be necessary to look well to the equipment of the studio, and to install such time and labor-saving devices as will permit the usual force to take care of the trade. A washing machine will help replace an hour or two of time, and a printing machine will enable one man to do the printing of two. Developing and plate-fixing baths and washers will save time and help, and should be installed

while there is yet time. Retouching is the greatest time consumer in the business, and we regret that none of the devices for speeding up this branch of the work have ever proved perfectly satisfactory. Where it has, in the past, been customary to employ the services of a piece-worker, arrangements should be made in advance so that in case such services are not obtainable at the crucial time, work can still be turned out without crippling the business.

Thought should be given to the possibility of all manner of shortages, not only in the work-room but in the material consumed. The manufacturers are short of help as well as the photographers, and while they are busy training new men, there are other factors that bid fair to interfere with the smooth and prompt delivery of necessary materials. So far as these can be foreseen and avoided, they will be, but certain delays will be unavoidable. Lens manufacturers have been compelled by the government to put a large part of their help on the manufacture of instruments and materials needed by the government, and the army will have first pick and choice. This, in itself, will interfere with the delivery of certain materials to the commercial photographers, but the manufacturers simply state that they are compelled to obey orders from Washington, and the trade must accept the situation as it is. We must all be prepared to adapt ourselves to what we can get, not to what we would like to have, and proper consideration of these possibilities will be invaluable if that thought enables the photographer to get out his work promptly and properly and meet the demands of his trade without serious interruption.

These are unusual times, and the unusual must be expected.

Begin right now to arrange your house in order, so that in case of an emergency you can rely on yourself and accomplish the work of two or three.—*Trade News*.

Studio Accessories

THE professional photographer desirous of holding his position, keeping in the front ranks, and making his business a paying concern, must keep constantly before him the state of his studio accessories. Portraiture is primarily a matter of dress, and secondly of furniture. The sitters do their part in appearing before the camera adorned with articles of attire adapted to the momentous occasion, the photographer having thrust upon him the duty of providing an environment which shall not spoil the effect his clients desire to produce for their own satisfaction and the edification of friends.

The Luxurious Style. It is sometimes urged against the portraiture of our leading professionals that the furniture is too profuse, occupying so large a portion of the stage that the sitter becomes merely a detail, an afterthought, put in to supply the human element in a picture, which might be appropriately labelled: "Interior, with Figure." To the photographic purist, the "Art for Art's sake" man, this criticism may appeal; to the man of business it will be made in vain, being summarily dismissed as of no practical worth. With this view we entirely agree, confessing to some regard for a portrait

containing a well-arranged selection of accessories. The photographer must please his clients, and when these are drawn from the upper classes—persons living in homes richly furnished—they require a portrait photography in harmony with such surroundings, desiring works having the air of wealth, of luxury, and it is thus in the interests of trade to meet the demand. In doing so the photographer violates no principle of pictorial representation, for in all times the artist has depicted his sitters in association with the things of their daily life—all artistic sentiment being against a duchess in a dairy or a dairymaid in a drawing-room.

The Conventional. While it is necessary to keep the accessories in harmony with the social position of the sitter, it should not be overlooked that all classes are susceptible to a certain amount of flattery in this connection, being more pleased with a portrait giving them a social standing above, rather than below, that which they really occupy. In all cases the photographer, whatever may be the class that gives him patronage, should be in advance, having accessories of a more expensive and luxurious nature than his customers are likely to possess. Only in this way can he apply this very subtle form of flattery. He already flatters the features by retouching, and this latter device is flattery to the dress. In working along these conventional lines a difficulty of a technical character will arise, needing attention to be overcome. The furniture designed for household decoration is inconvenient for studio use, not lending itself readily to photographic methods of composition and posing. It is too angular, possesses awkward scrolls, quite preventing the subject being brought close enough for securing a good effect. A small knob is sufficient to separate the sitter from a chair or table, creating a lack of unity in the composition, making it a picture of two objects in place of the simple design intended. Photographers who have experienced this drawback are constantly on the watch for any article combining a good design with utility in studio practice, in this way renewing their stock. Attempts have been made in supplying accessories to suit professional purposes, not with much success, for, while quite adapted to that end, they diverge too much from domestic patterns; in a picture looking what they are—quite photographic. There is here a want yet to be supplied, a field is open for the furniture designer who is able to combine photographic utility with a pattern neither grotesque nor unusual.

The Plain and Simple. In general, professional portraiture must be conventional, the usual thing, the photographer, whatever may be his own desires or aspirations, being compelled to meet the demands of the public taste. In particular localities, however, a class exists who will patronize work departing entirely from popular notions. Novelty attracts, and the man with a strong personality can impress the public, lead them to support him, and acquire a taste for his own individual style. An effective portraiture will follow from discarding all accesso-

ries and paying close attention to expression, lighting, posing, and drapery. Mrs. Cameron was one of the earliest of these unconventional types, though since her time others—such as those who model their work after the paintings of Rembrandt, Gainsborough, Reynolds, or Velasquez—have met with success. To abolish accessories is to give added importance to the background. It becomes the chief study, requiring every attention to make it harmonious with the style of the subject. It is for this reason that the above-mentioned painters have been so closely copied by the Cameronian type of photographer. To some tastes this simple portraiture is very agreeable, and, with the right man, and a fitting neighborhood, enough patrons are secured to make it commercially profitable. A few can even go beyond it, with work that approaches to the "soul studies" characteristic of Watts: Mere sketches and suggestions, in place of the clear, sharp, well-defined photograph. However interesting these productions may be, in the present state of public taste, the demand for them must remain strictly limited, and the majority of professionals could not insist on supplying such work to their clients and still retain a profitable connection. From a financial point of view it would be a distinct gain if expensive accessories could be abolished, since the charge on a business which they entail, not only in purchasing, but in keeping in good condition, would go with them. This was impressed on us upon once visiting the studio of a photographer of this class, a well-known man, whose work is much appreciated; beyond a few backgrounds, painted by himself, some drapery and screens, his accessories were only of a nominal value. A scanty outfit, calling for little expenditure, reducing the cost of working expenses to a minimum, is a consideration when competition is so keen as nowadays, anything tending to keep down expenses without reducing efficiency being money saved. Here the business man must study his public, for it will economize his resources if he can rely on clients who are satisfied with a portraiture of the simple kind.

For Some

At times a man gets a fool notion that he must be a nasty, cursing, irritating sort of a creature provided he can pretend to the public that the reason for his general nastiness is the fearful load of responsibility he carries all the week; but when the children crawl under the bed, and the cat hikes for the back fence, and the dog growls, and the neighbors call their children into the house when they see him coming—there's something wrong, even when the man thinks he is making sweet music by rattling loose change in the shape of five-dollar gold pieces in his pocket.

A little gold in one's heart, a little of the milk of human kindness and consideration in one's veins, and a little laughter in one's voice are worth more than a lot of gold in the bank or pocket.—*Thomas Dreier.*



United States Official War Photographers

WASHINGTON, October 30.—Official war photographers are now with the United States forces in France. Wherever American soldiers and sailors go, they will be followed by the faithful moving picture man, ready at any minute to grind out, "U. S. troops go over the top," or "Heavy gunfire on the firing line." Other members of the photographic division will take "stills," and yet others attached to the aviation section are preparing to secure photographs of enemy trenches and fortifications in the face of hostile fire.

Our photographic division was planned and built up almost over night. It is only a few weeks old, but already it is one of the most important branches of the service. There are no raw recruits in the division. Every man is there because he can do some particular thing, and do it well. When the War Department decided that the time had come to organize the staff of camera men and laboratory workers, it did not wait for casual volunteers. It got in touch with the Committee on Public Information, and the committee immediately produced data on the best available photo-scientists, moving picture men and still-camera men in the country. Two months later the photographic division of the Signal Corps was occupying four rooms of Washington's priceless office space, and four majors, a captain, two or three dozen lieutenants and a number of enlisted men were directing, studying and experimenting in laboratory, office and training camp. Just exactly how many men are, or will be, in the division cannot be made public, as this information would indirectly disclose the number of men abroad.

At the beginning of the war unofficial photographers were allowed on all the war fronts by the foreign authorities. The belligerents quickly learned that this was an unwise procedure, for it resulted in a leakage of valuable military information. Today the official photographer has the field to himself, working as a part of the military machine. The British government has three official camera men to take war news pictures for the public. All of our war pictures will also be official, but our news camera force will run into the hundreds.

From abroad we secured the idea of releasing

the pictures for the benefit of the war relief societies. The Russian war news pictures are in the hands of the Skobelev committee, an organization for the relief of Russian wounded in the hands of the enemy. This committee is authorized by the Russian government and headed by a Russian army officer. It sends out its official photographers on assignments, and then manufactures and sells the pictures taken, the proceeds going for the benefit of the relief work. Our use of the Red Cross in this matter will be limited to the distribution of the pictures to picture companies through the nation. A special Red Cross committee will distribute the official pictures that are turned over to it by the Committee on Public Information, and the net profit will be added to the Red Cross fund.

The photographic division is so new that it seems natural to refer to its activities as affairs of the future. The fact is that even now its pictures are being printed in the newly created Signal Corps photo laboratory in Washington, and results of its work are ready for use. Lenses, paper and photographic apparatus of all kinds are being studied and improved, though the most up-to-date and labor-saving equipment is in use.

Many of the officers in charge of the photo laboratory are news photographers who have seen service on every European front. The enlisted camera man faces the same dangers and hardships as the soldier in the front line of trenches, but the civilian war photographer has a few extra worries, such as being continually taken for a spy and often nearly shot, and having his best pictures held up by the censor. Diplomacy is more essential to him than a passport, for by diplomacy a general may be induced to trot out a battalion or so and stage an attack or shoot off a few four-inch guns. He may even, if properly approached, send his army out of a city already taken and let the camera record the triumphal entry for the benefit of the public. Such pictures are not properly speaking fakes, because they represent true conditions, and merely have the advantage of being taken under favorable circumstances. Most war pictures, however, are snapped without special preparation.

Pictures by our men, stamped with the seal of approval of the Committee of Public Informa-

tion, will soon be featured at local moving picture theaters. Already they are being displayed in newspapers and magazines. These and other pictures of a more technical or confidential character will be studied in training camps and at the War College. Representative pictures will be laid aside for historical purposes; so that America's share in the great war will be vividly preserved for future generations of Americans.

At the beginning of the present war Germany was the only country prepared to put aerial photography into practice. England, France and Italy had experimented along this line, but a practical camera had not been evolved. Certain early German successes were attributed directly to efficient work of scout photographers, who secured sufficient information to enable German troops to attack without hesitation at critical points. But by October an Italian moving picture camera was taking pictures at a height of 4000 feet, and cameras achieving varying degrees of success have been in use on both sides ever since. Clarity and sharpness of lines and detail are essentials of military photographs. A lack of perspective in pictures taken from directly overhead gives almost the effect of a map, and a map with blurred and hazy lines is not satisfactory in any way. German airplanes falling within the allied lines have several times placed unique cameras in the allies' hands.

War Photography

SERGEANT WILLIAM GROAT, photographer for the United States Army, and, as such, official photographer of Pershing's expedition into Mexico, will be in charge of the photographic instruction to be given in the School for Photographers, to be opened in San Antonio, Tex., for the Signal Reserve Corps. Sergeant Groat's pictures already are well known in army circles. On the Mexican expedition alone he took over five thousand views, which have become part of the Signal Corps records.

Instruction for the movie operators who also are to be enlisted to film the Government's record of the War of 1917, will be in charge of Roy E. Reeder, of Ballinger. Mr. Reeder, who is both a motion-picture show proprietor, having a string of shows in Texas, and a student of cinema photography, is considered an expert in that line.

R. James Wallace with the Central Dry Plate Co.

THE Central Dry Plate Co. have sent out notice that Mr. R. James Wallace is now associated with them. His chief duties will be along the line of research work with a view to making improvements wherever possible in the quality of the Central products and in putting new brands on the market. Mr. Wallace is a member of many American and foreign learned societies and has been for many years head of the Research Laboratory of the G. Cramer Dry Plate Co.

"Unconventional Portraiture."

THIS is the title of the latest issue (165) of *The Photo Miniature* and presents one of the most interesting and valuable numbers of this series. We are told (in Mr. Tennant's clear, delightful

style) what unconventional portraiture means; where it began; the spirit of it, and how to do it—with a few examples from noted photographers, which illustrate the text. Seldom is so much good practical material put in so concise a manner and at such an enticing price—25 cents.—For sale by all dealers.

Sherill Schell Returns to U. S.

SHERILL SCHELL, whose distinctive work as a photographer has won for him a deserving international reputation, has recently returned to this country.

While devoting years to portrait photography Mr. Schell's experiences and other aims in life are interesting. At the outbreak of the war he was on a holiday in Belgium and did some notable work for many months with the French Red Cross, being in the firing line on many occasions. In addition to his accomplishments in photography, he is a bibliographer and a writer of note, his art criticisms having attracted especial attention here and abroad.

We are sure to hear more from Sherill Schell in the near future.

Well-known House, Sol. Pudlin Co., Moves Up Town

THE old and well-known photo supply house of Sol. Pudlin Co., which for years has made its headquarters on the Bowery, has moved into large and attractive new quarters at 1212 Broadway, New York City. They occupy three ample floors in this building, and are thoroughly equipped with the latest photographic appliances and standard goods. When in town a visit will repay you.

"About Lenses"

If you want to know how a lens forms an image, or about focal length, depth of focus, and why cameras have different kinds of lenses, this little book will tell you in a clear and concise way all about it, and it will enable the inexperienced to select a camera fitted with the kind of lens that is best adapted to particular requirements. This information may be just what you are looking for, and can be had for the asking by writing the Eastman Kodak Co., Rochester, N. Y.

To Take Census of Photographers

A LETTER that has been received by the Rochester Camera Club, Rochester, N. Y., from the chief signal officer, War Department, asks that it assist the department in the taking of a census of photographers.

Apparently Uncle Sam is in need of photographers for work with the army and navy and is endeavoring to ascertain the number available. Photographers accompany aviators on scouting duty and take pictures of trenches, ammunition dumps, roads and everything else that may be of importance. They also have pictures to take on the ground behind their own firing line.

Of course, the War Department when asking for the census of photographers does not want

the names of persons who know only how to operate small cameras. A blank will be furnished by the War Department for photographers to fill out.

Some of the questions as to experience that must be answered on the census blanks are: Motion-picture operating, feature films; motion-picture operating, news films; motion-picture developing; motion-picture printing; motion-picture toning, tinting, finishing; motion-picture assembling and cutting; motion-picture titling; motion-picture protection; motion-picture storage; still work, outdoor; still work, press photography; still work, commercial; still work, studio; still work, studio, laboratory; still work, newspaper laboratory; still work, commercial amateur finishing laboratory; color photography; enlarging; developing; printing and finishing; retouching; camera repairing or construction; foreign languages known; military experience, if any; aviation experience, if any; experience in aviation photography, if any.

Blanks for photographers wishing to enroll in the census and further information may be obtained by addressing M. Francis Moffatt, in care of the Rochester Camera Club, No. 123 Main Street, West.

\$8,000,000 Photograph Company

UNDERWOOD & UNDERWOOD, photographers, have incorporated in Delaware with \$8,000,000 capital stock. The previous incorporation, registered in the State of New Jersey, was for \$100,000.

Elmer Underwood, the Treasurer, states that the corporation had been expanded because it was planned to open branch houses in various parts of the country and that more capital was needed for that purpose. He said the growth of the business was not due directly to the war or the sale of pictures from Europe, and that most of the branches would be in the line of commercial photography.

Prize Contest Open to Teachers College and Columbia Alumni

MRS. C. H. JAEGER, the wife of Dr. Charles H. Jaeger, of the College of Physicians and Surgeons, and for some time a student at Teachers College, has recently offered three prizes for the best photographs of the buildings and ground of Columbia University, including Teachers College. There is no limit to the size or character of the prints other than that they shall be made as permanent as possible and shall be mounted ready for an exhibition to be held next winter.

Any one, now or formerly, a student of Teachers College or of any other part of Columbia University may submit prints. The contest will close December 16, 1917, after which time the three prizes of \$75.00, \$25.00, and \$15.00 will be awarded.

For further information address Professor Arthur W. Dow, Teachers College, Columbia

University, or Mr. Clarence H. White, School of Photography, 122 East 17th Street, New York City.

Exhibition of Pictorial Photography

THE Portland Camera Club has in its assembly rooms at the Portland Society of Art, an exhibition of Pictorial Photographs by Mr. Dwight A. Davis, of Worcester, Mass. There are twenty-nine pictures, and they are worthy of everyone's study. Mr. Davis is known for his portrayal of sunlight, and in his platinum and gum prints shows his ability to handle the light and shade with great delicacy. Mr. Davis's pictures are mostly figure studies of very pleasing sentiment and versatile in selection. Some depict romantic conceptions, some poetry, while others show the scenes of an everyday home in a manner full of sentiment and charm. He also shows some fine heads as well as some very interesting still-life pictures. All of Mr. Davis's prints are excellent technically, both in low and high-keyed work and are full of charm and atmosphere.

The Portland Camera Club has arranged as a part of its schedule to have frequent one-man exhibition from some of the best photo pictorialists in the country. During the past year there have been exhibitions from such men as Mr. W. H. Porterfield of Buffalo, Dr. Ruzicka and Mr. Karl Struss, both of New York, etc., and this season's schedule contains among other names those of Dr. A. D. Chaffee of New York and Mr. Edward Henry Weston of California, the latter a member of both the Pittsburgh and London Salons.

New Catalogue of Flashlight Apparatus and Powders

WE have received from the Prosch Mfg. Co., 334 Fifth Avenue, this city, their new and complete catalogue of flashlight apparatus and powders. This catalogue places in the hands of professionals and amateurs a safe guide, and explicit instructions are given just how to use everything offered. The flashlight is of so much importance and has such large possibilities these days that every one should be well informed in standard goods.

Death of William A. Cooper

WILLIAM A. COOPER, one of the best-known art photographers in this country, who made a specialty of reproductions of the paintings in the galleries of American millionaires, died on Friday, November 9 at his home 1714 Avenue J, Flatbush, N. Y., in his seventy-fifth year. Up to the time of his retirement, three years ago, he had a studio at 292 Fifth Avenue, Manhattan. Mr. Cooper was born in London, Canada, and spent several years abroad studying his profession at London, Paris and Munich, and on his return brought back many original methods which he employed here. Among the notable collections he photographed were the Widener, Elkins, and Johnson collections in

Philadelphia; the Frick gallery in Pittsburg; Sir William Van Horn's collection in Montreal, Canada, and the Hearn and Isaac and Louis Stern collections in this city.

Get the Soldiers' Business

If an army of a million men is raised, the services of approximately one out of every hundred of our population will be required. Every one of these men should be photographed, and most of them will be, but they need to be reminded—and this is up to you.

Be careful how you handle this delicate subject in your advertising. Put yourself in the place of the soldier boy's mother or father. If some one said to you: "I am mighty glad my boy isn't old enough to go, for he wants to, and I am afraid a lot of them will never come back; if I were you, I would insist on my boy having his photograph made, for you may regret it if you don't"—that sort of an argument wouldn't make you feel a bit good, would it? But on the other hand, if someone were to say: "It's a grand thing to be able to serve your country and I am only sorry I can't go. I think the boys should have their pictures made for those of us who *have* to stay at home, and we should send them pictures of the home folks to show them that out hearts are with them"—that kind of argument would make you feel a lot better, wouldn't it?

Make your advertising appeal to the loyalty of the boys to their homes as well as to their country—tell them that their friends are proud of them—that they want their photographs in uniform, and you will have appealed to sentiment without giving a twinge to heartstrings that are already tense with emotion.

Cheerful, optimistic advertising will bring results much more quickly than that which brings tears, suggests broken homes, and discourages loyalty. Let your advertising be free from any note of calamity—but advertise for the soldier's business, make the best work you know how to make and you will get results.—*Photo Digest*.

BREVITIES

Photographic Subjects in Leading Periodicals

"The Stencil Process of Coloring Cinematographic Positives," by A. S. Cory, *Motion Picture News*, August, 1917, p. 1038.

"Storing Paper," *British Journal of Photography*, 1917, p. 392.

"Some Points in Copying," *British Journal of Photography*, 1917, pp. 447, 459-470.

"Hydrochinon Toning," *Camera*, October, 1917, p. 537.

"Photographic Resolving Power," by A. S. Cory, *Motion Picture News*, September, 1917, pp. 2055, 2231.

"The Photographic Rendering of Tone Values," by C. E. K. Mees, *Studio Light*, August, 1917, p. 6.

"Stains on Negatives and Prints," *Photo Era*, August, 1917, p. 66.

"The Effect of Moisture," *Studio Light*, August, 1917, p. 14.

"Tone Rendering and Quality in Gaslight Papers," by T. D. Tennant, *Photo Era*, October, 1917, p. 172.

"System in Retouching for the Trade," *British Journal of Photography*, 1917, p. 472.

"Trick Work and Double Exposure," by C. L. Gregory, *Moving Picture World*, September, 1917, pp. 1854, 2002; October, pp. 90, 238, 542.

"The Technicolor System of Color Photography," by A. S. Cory, *Motion Picture News*, October, 1917, p. 2606.

"Removing Developer Stains by Redevelopment," *Studio Light*, August, 1917, p. 22.

"Unconventional Portraiture," *Photo Minature*, September, 1917.

"The Laws of Fixation," by A. W. Warwick, *American Photography*, November, 1917, p. 585.

"The Physical Characteristics of the Elementary Grains of a Photographic Plate," by Millard B. Hodgson, *Journal of the Franklin Institute*, November, 1917, p. 705.



AMONG THE SOCIETIES



Middle Atlantic States Convention in Baltimore Next March

WE learn from the secretary, William Kinling, that active and elaborate preparations are being made for this big convention, which is to be held in Baltimore next March. President A. H. Diehl is devoting most of his time forming a program and from all accounts every indication is for a helpful convention and a big attendance.

Professional Photographers' Society of New York

A MEETING of the Executive Committee was held at Baggs Hotel, Utica, October 31, 1917, at 2 P.M.

President F. E. Abbott, Little Falls; secretary E. U. Smith, Honeoye Falls; treasurer Edwin Park, Oneida; Mary A. Stewart, Canandaigua; F. E. Spedding, Ithaca; F. E. Hewitt, Corning;

E. H. Stone, Hamilton; W. E. Bacon, Utica; C. Olszewski, Utica; W. G. Mandeville, Lowville, and C. K. Frey, Utica, were present.

Meeting called to order by President Abbott and by unanimous vote C. K. Frey was chosen permanent chairman of the Executive Committee.

Letter read from past-president E. L. Mix, New York City, expressing his regrets at not being present and pledging the support of the Metropolitan Section in the coming State convention. Letter of regret also read from W. E. Talbot, Schenectady, N. Y., and George W. Thompson, Iilon, N. Y.

The matter of the coming State convention was thoroughly discussed and it was decided to hold the convention February 26, 27, and 28, 1918, at Hotel Utica, Utica, N. Y. Many valuable suggestions were offered to make this convention of special helpfulness. It was also suggested that photographers write the President whatever they think would tend to make the convention better.

The committee was in session over three hours and was pronounced one of the best executive meetings yet held

F. E. ABBOTT, President.

The New England Convention

THE Photographers' Association of New England held its 19th annual convention in Infantry Hall, Providence, R. I., from September 25 to 27, inclusive, and while it was the first photographers' convention ever held in Providence it was one of the most satisfactory meetings yet held from many points of view. The attendance was 347, and the banquet was enjoyed by 129. The exhibits were most attractive and well arranged, and altogether formed an interesting and educational display worth studying. The next annual convention of the Photographers' Association of New England will be held in Springfield, Mass.

Officers elected: L. B. Painting, Concord, N. H., President; John Sabine, Providence, R. I., Vice-president; A. E. Whitney, Norwood, Mass., Secretary; E. H. Holton, Boston, Mass., Treasurer.

State Vice-presidents: Maine—Frank Adams, Portland; New Hampshire—C. L. Powers, Claremont; Vermont—H. E. Bosworth, Springfield; Rhode Island—Earl Mills, Providence; Connecticut—A. K. Peterson, Hartford.

National Photographic Manufacturers' Association

RESOLUTIONS passed at the first meeting held at the Narragansett Hotel, Providence, R. I., on September 26, 1917:

Be it resolved: That we, the undersigned, manufacturers of photographic materials, have organized under the name of National Photographic Manufacturers' Association.

Be it further resolved: That the primary object of this Association is to exert every possible effort to improve photography for those who follow it as their cherished profession.

Be it further resolved: In order for the N. P. M. A. to work in closer harmony with the Amalgamated Associations and the National

Association of Professional Photographers throughout the United States, that the local secretary of each and every association of professional photographers operating under a national charter, submit to the secretary of the P. A. of A., ninety days before the date of the convention, the proposed program of their respective conventions in order that the secretary of the national organization, through his experience in convention work and his constant close contact with the problem of both photographer and manufacturer, may suggest changes thereto and give to same his approval, which will be considered official, thus assuring both the consumer and the manufacturer a convention of vital interest and profit greatly surpassing any former effort along convention lines.

Be it further resolved: That the secretary of the P. A. of A. shall submit to the officers of the N. P. M. A., or to a representative number of manufacturers to be specified by the N. P. M. A. sixty days before the convention date, the approved program for the consideration of the manufacturers before returning it to the secretary of the Amalgamated Associations by whom submitted.

Be it further resolved: That the diagram of floor space for a convention shall not be mailed to the manufacturers until after the proposed program for the convention has been submitted by the local secretary to the national secretary and by him to the N. P. M. A. and found agreeable to all, returned to the local secretary, from whom it originally came, and that the floor plans for every convention shall have the "OK" of the secretary of the P. A. of A. before being mailed to the manufacturers. This will enable the manufacturers to work in closer coöperation in the preparing and arranging of their displays.

NATIONAL PHOTOGRAPHIC MANUFACTURERS' ASSOCIATION

G. A. CRAMER, Chairman.

JOS. A. DAWES, Secretary.

Anso Company	Eastman Kodak Co.
Calif. Card Mfg. Co.	Wollensak Optical Co.
Central Dry Plate Co.	Haloid Co.
Taprell, Loomis & Co.	Hammer Dry Plate Co.
A. M. Collins Mfg. Co.	Presto Mfg. Co.

G. Cramer Dry Plate Co.

Annual Meeting of the Pictorial Photographers of America

THE annual meeting of the Pictorial Photographers of America was held at the club-rooms of the National Arts Club, New York, on Monday evening, November 5. Following we give the names of officers and executive committee elected for the ensuing year: Clarence H. White, president; Gertrude Kasebier, Hon. vice-president; Dr. A. D. Chaffee, vice-president; Edward R. Dickson, secretary; Dr. Charles H. Jaeger, treasurer. Executive committee: Henry Hoyt Moore, Maud H. Langtree, Karl Struss, Ray Greenleaf, Walter L. Ehrich, Adele Shreve, Charles J. Martin, Arthur D. Chapman, Dr. D. J. Ruzicka.

The secretary, Mr. Edward R. Dickson, has presented in a very clear manner some of the

accomplishments and aims of the association, which we are pleased to quote in part:

"In the successful arrangement of the Eastern and Western Traveling Exhibitions of Pictorial Photography, which will be shown in sixteen of the leading art museums and public libraries throughout the country, the Pictorial Photographers of America has introduced itself to the public as an Association having in mind solely the development of the art of photography from a stand-point of educational value. The position of this Association is unique, since it affords the worker, not only an opportunity to exhibit his pictures, but insists upon the maintenance of photographic standards, and encourages its members to study the arts for breadth of view.

"The Association consists of well known men and women—who have pledged themselves to place photography on the highest plane, and who by diligent work have been able to accomplish, in the first year of their organized effort, that which has never been done for photography before. Membership is open to men and women of fine character and ambitious intentions, including those who, though not photographers, are interested in the development of the art. Monthly meetings are held at the National Arts Club, New York, from October to June, when interesting papers are read."

The latest (October) number of the *Photographic Art*, the official organ of the Association, is truly "a thing of beauty and a joy forever" and bespeaks the high art standard and aims of the members. Every photographer interested in pictorial photography will value a copy.

Report of the Professional Photographers' Association of Texas Convention

THE meeting of the Association in convention was called to order on the morning of October 10, in the City Auditorium of Houston, by President Elliott, all officers being present. The address of welcome was made by Mayor Hutchinson, of Houston, who made many kind references to photographers in general and those present in particular, and told the boys and girls that Houston and all it contained was theirs to do with as they saw fit. The Mayor missed his calling; he should have been a photographer. Art Edwards, President of the Houston Photographic Association, answered the Mayor's address in a few well-chosen remarks, which won the hearts of all who were present.

Minutes of previous meeting were approved and the following committees appointed by the President:

Constitution and By-Laws: C. I. Browne, of Dallas; M. Kempe, Hempstead; J. S. Hutchcraft, Houston.

Auditing: C. Christiansen, Austin; Fred Winkleman, Brenham; Joseph Lux, Sealy.

Necrology: H. J. Braunig, Hallettsville; C. B. Burdsal, Dallas; Mrs. F. P. Davenport, Waxahachie.

Resolutions: C. I. Browne, Dallas; A. L. Blanchard, Hillsboro; A. M. House, Ladonia.

Communications were read from many who were unable to attend. Also a letter from C.

Weichsel, stating that Mr. S. S. Griffith, their manager, could not be present owing to the death of his wife. Resolutions of condolence and regrets were adopted by a rising vote.

October 11: Communications were read from various photographers and dealers; one of special interest being from W. D. Orr, Memphis, Texas, who sent a check for \$12.50 to be used by the Association as it was needed. Mr. Orr also suggested that the Association buy Liberty Bonds and place itself on record as an up-to-date body of men and women.

The Resolutions Committee suggested the changing of the By-Laws so that the offices of Secretary and Treasurer be combined. This report was accepted and the motion adopted.

The election of officers followed, and resulted in the election of A. M. Howse, of Ladonia, President; C. I. Browne, Dallas, Vice-President; A. L. Blanchard, Hillsboro, Secretary-Treasurer. All being elected by the Secretary casting the vote for the Association.

October 12: Auditing Committee reported that the books of the Secretary and Treasurer were "absolutely correct."

Resolutions of thanks were extended to the citizens of Houston, the daily press, and a special vote of thanks was extended to L. C. Irons and the Schaeffer Photo Supply Co., for their magnificent entertainment. A vote of thanks was extended to the Houston Association of Photographers. Special stress was placed upon the fact that the members of this Association closed their doors one whole afternoon to go with the "bunch" on the boat trip. A vote of thanks was extended the retiring officers. Then came the impressive service of Mr. Rockwood presenting President Elliott with a small token of esteem from the members, dealers and manufacturers in the form of a beautiful Masonic watch charm. Martyn rose to the occasion and even surprised himself by making a speech that would have done credit to the Secretary.

The awarding of prizes resulted in:

Grand Prize—Browne & Browne, Dallas.

Grand Portrait—Paul Nashke, Galveston.

Open to the World—R. C. Nelson, Hastings, Nebr.

Class A—Mrs. P. F. Davenport, Waxahachie.

Class C—G. W. Miller, Midland.

Class D—D. T. Mauldin, Munday.

Complimentary—H. J. Braunig, Hallettsville.

Wollensak Cup—Voorhees & Burdsal, Dallas.

Cyko Cup—Voorhees & Burdsal, Dallas.

The modern studio was a big success, as all were agreed. The negatives were made and finished so that the work could be followed from beginning to end. C. I. Browne, of Dallas, made a hit in his reception-room methods. Mrs. E. A. Kroner, of St. Louis, demonstrated the efficiency of her photo print dryer and incidentally made several sales, which shows that it is up-to-the-minute and the photographers know it.

The attendance was said to be the largest had in many years, and, in fact, some who know more about Texas affairs than the Secretary, claimed it was the largest ever held, if studio owners were counted only. The members were pleased, the officers were pleased, the dealers were pleased, and the manufacturers, so far as we have heard, were pleased.



THE WORKROOM

By the Head Operator

DOREYPES AND HOW TO MAKE THEM
THE TONING OF GELATINO- AND COLLODIO-CHLORIDE PAPERS
INTENSIFICATION WITH CHROMIUM
BROOCH AND PENDANT PORTRAITS
COLLOTYPE PRINTS FROM BROMIDE PAPER

THE SIMPLICITY OF THE CARBON PROCESS FOR PORTRAITS
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COLD WEATHER DIFFICULTIES
PRIZE SLIDES AND HOW TO MAKE THEM

Doretypes and How to Make Them

THE new style of picture, the "Doretype," which has recently been introduced to the photographic trade through the Eastman School of Professional Photography, has met with an unusual amount of favor from coast to coast.

Photographers who have taken up this new process with the idea of making every picture as attractive as the process permits, have been successful. Doretypes sell at prices that insure a good profit and permit the necessary amount of care to be given each piece of work.

The popularity of the Doretype is due to its unusual attractiveness, but the effectiveness of the picture depends in a great measure upon the setting it is given. The Doretypes shown at the Eastman School are mounted in handsome leather cases made specially for these pictures by Taprell, Loomis & Co. The pictures in themselves are beautiful, but a handsome case becomes a part of the picture and adds materially to its attractiveness and to your profit.

With edges simply bound or the picture mounted in a frame, even though it be the best frame you can buy, much of the attractiveness of the Doretype is lost. You would not think of framing a Daguerreotype and, like the Daguerreotype, the Doretype needs a fitting setting to show it to the best advantage.

The Doretype is a warm-toned, thin, positive image on glass and receives its brilliancy from the material which is used to back it up. It lends itself to almost any treatment—may be backed with light tinted papers or various shades of fine silk or satin, but the most satisfactory method is to coat the back of the transparency with a fine gold bronze.

The following instructions will give a fair idea of the method, and a few experiments will enable you to determine how the best results are secured.

The first requirement is a clear, thin positive from any good negative. From large negatives the positive should be made by reduction, as the most attractive Doretypes are in small sizes. Give full time and soft development, so that the positive will be thin but full of detail. If you must work from a flat negative, a contrasty developer will be required; if your negative is contrasty, a soft developer will be required; while if you have a well-balanced normal nega-

tive, a normal developer will give you the best positive. The positive must be thin, because the effect of brilliancy is secured by the light reflected from the material used back of the positive. A Seed 23 plate will give the best result in making these positives.

When the positive has been developed, fixed and thoroughly washed it should be redeveloped in the redeveloping solution recommended for giving sepia tones on Eastman bromide paper. The formula is as follows:

Make up stock solution as follows:

No. 1—Bleaching Solution

Potassium ferricyanide . . .	5 oz.
Potassium bromide . . .	5 oz.
Water	120 oz.

No. 2—Redeveloping Solution

Sulphide (not sulphite) of soda . . .	5 oz.
Water	60 oz.

Prepare bleaching bath as follows:

Stock solution No. 1 . . .	4 oz.
Water	4 oz.

Prepare redeveloper as follows:

Stock solution No. 2 . . .	1 oz.
Water	8 oz.

Immerse the positive in the bleaching bath, letting it remain until only faint traces of the half-tones are left and the black of the shadows has disappeared. This operation will take about one minute. Rinse thoroughly in clean cold water. Place in redeveloper solution until original detail returns (for about thirty seconds). Rinse thoroughly, then immerse for five minutes in a hardening bath composed of 1 ounce of the following hardener to 16 ounces of water.

Water	5 oz.
E. K. Co. sulphite of soda . . .	1 oz.
No. 8 acetic acid (28 per cent.) . .	3 oz.
Powdered alum	1 oz.

The redeveloped positive is thoroughly washed and dried and very carefully spotted. It is now ready for backing. If silk is to be used, only the lightest shades and finest surfaces will be found suitable. If tinted paper is used, an enameled or very smooth surface is best. Lay the positives

on the material to see what the effect will be. If several positives of the same subject are developed to different strengths it will be easy to determine the best quality for Doretype results by placing the several positives side by side on the same material and comparing the results.

If Doretotypes are to be tinted, transparent colors should be used, and these should be very carefully blended; too little color is preferable to too much; a delicate tint against a light background will be found most pleasing. When silk is used as a background it should be backed up with cardboard, cotton and paper. Cut a piece of cardboard the size of the positive, lay a piece of cotton batting on the cardboard, cover the cotton with a heavy sheet of white paper, and place the silk over this. Lay the positive on the silk, being careful to see that it is not wrinkled, and *passe-partout* the positive and backing together. By applying a slight pressure while binding the edges the cotton will hold the silk in good contact.

One of the most generally used methods of backing is to coat the film side of the positive with gold bronze. It is necessary to use care in selecting the bronze powder, as these pictures are very often small, and a coarse grade of powder will give a coarse grain to the picture. A dark gold bronze gives a dull effect that is not pleasing. The best effect is secured by using a very fine, natural-gold-color bronze that will work very smoothly. In most cases this powder can be supplied by the photographic stock houses in 1 ounce packages under the name "Light gold photo coating powder." This powder must be combined with a liquid, and it is important to use one that will not affect the silver deposit or the gelatin and that is as nearly colorless as possible. The dark-colored bronzing liquids change the color of the bronze and the effect of brilliancy is lost. The best thing we have been able to find for liquifying bronze powder is lantern slide film varnish. This varnish is colorless, dries in about thirty minutes, and does not affect the silver image or the gelatin. A four-ounce bottle of this varnish costs thirty-five cents. Use a small amount of the bronze powder, and add varnish until the mixture is about the consistency of thin paint. Apply it to the film side of the transparency with a flat camel-hair brush about $\frac{1}{4}$ inch wide, and allow to dry with the transparency lying perfectly flat. If the bronze shows brush-marks when dry it has been applied when too thick. The solution should be thin enough to flow together, should be applied quickly, and should not be gone over once the entire surface has been covered.

With this method the finished picture should also be backed and edges bound to protect it from moisture. If the positives have been properly handled the results will be as permanent as the silver image itself.

Don't make Doretotypes in large sizes; don't show them except in appropriate cases; don't look upon them as cheap novelties. They should rank with miniatures, and they surely give you the opportunity to offer your trade something out of the ordinary for gift pictures.—*Studio Light*.

The Toning of Gelatino- and Collodio-chloride Papers

TONING is the most delicate operation which the photographer has to carry out in his work. Very small things suffice to completely upset it: a wrong or unsuitable strength of the bath will cause false contrasts to be formed in the prints; an incorrect chemical state of the solution will be the cause of faded prints. It is, in fact, most necessary to grasp the meaning of toning and the functions of the constituents of the bath used in order to produce reliable results without hesitation and without failure.

There are three chief kinds of printing-out papers which are toned with gold, platinum, or some other metal. The first of these is plain salted paper; the other varieties are gelatino-chloride and collodio-chloride P.O.P. The three may be treated alike, but the best results are obtained if each receives special and suitable treatment.

The ordinary printing-out paper, in which gelatin is the vehicle for the sensitive salts, is usually prepared with a mixture of free silver nitrate, silver chloride, citric acid, and either the citrate or tartrate of silver. The silver chloride and citrate become reduced during exposure to light to subsalts which are almost insoluble in sodium thiosulphate, or hypo. Some of the silver nitrate, which is, of course, a soluble salt, is partially utilized in the formation of the printed image, but the majority of it remains in the film, as does also the total amount of citric acid; preservatives and hardening agents used in the emulsion are either soluble or else unite with the gelatin and form inert substances.

In order to carry out toning under the most suitable chemical conditions, it is necessary to work with an image of insoluble reduced silver salts in a film of pure gelatin, and the obvious way to produce such a print is to thoroughly wash the film. Some of the largest users of P.O.P. never give any washing previous to toning, and obtain highly satisfactory results; but if this be done there is either a rapid deterioration of the toning bath or else the toning is not all due to the deposition of gold. Certain makes of P.O.P. have very much less free silver in the film than others, and it is curious that the latter seem to give the best results when toned without previous washing. The method is, however, a very ill-advised one.

The object of the toning bath is to deposit gold upon the image and so provide a covering which is in every way permanent; hence, the usual selection of such metals as gold, platinum, palladium, iridium, etc. It has been found in practice that a slow deposition of the metal gives the best and most stable results; in other words, very quick toning is not to be recommended.

The best prints for toning are those which have been *slowly printed* in well-diffused light and have a good amount of contrast. Take, for instance, the analogous case of a plate overexposed in a brilliant light; the negative is very flat and develops too rapidly, with the result that there is no *body* in it. Now a rapidly printed piece of gelatino-chloride or other printing-out

paper, though it may look quite dense on the white paper support, is in reality equally flat. But in toning, every atom of gold deposited on the image robs the latter of at least one atom of silver; much toning, therefore, diminishes the body of the image, and a weak image will not admit of this. Hence a fairly dense image containing plenty of silver is absolutely necessary.

The gold trichloride of commerce may be represented by the chemical formula AuCl_3 ; in the preparation of some baths the trichloride is reduced to the monochloride, AuCl ; the action of these salts upon the silver of the image is as follows:

- (1) $\text{AuCl}_3 + 3\text{Ag} = \text{Au} + 3\text{AgCl}$.
- (2) $\text{AuCl} + \text{Ag} = \text{Au} + \text{AgCl}$.

In the latter case only one atom of silver is converted into silver chloride for each atom of gold deposited. The AgCl , of course, fixes out in the hypo bath.

The easiest method of thoroughly preparing the prints for toning is to wash them in plain tap water until it no longer becomes turbid, *i. e.*, until the chlorides in the water no longer have any more free silver nitrate with which to react. Immersion in a salt bath is often recommended, especially before platinum toning, but it is not imperative even in the latter case if the preliminary washing has really been thorough, and for this it is necessary to keep the prints well separated. Sometimes immersion for a few seconds in a dish of water which has been rendered *very slightly alkaline* by the addition of a few drops of 10 per cent. ammonia will assist toning, as it neutralizes the last traces of acid in the film; but the alkaline character of ordinary tap water is usually sufficient to insure neutrality of any acid not removed by actual solution.

One of the most easily manipulated and certain baths is a dilute one in which plain neutralized gold trichloride is employed. The formula is as follows:

Water	1 pint
Gold chloride	1 gr.

To this add sufficient of a saturated solution of sodium bicarbonate to just neutralize the acidity. This may be found by testing with litmus paper; as soon as neutral litmus paper remains mauve and is no longer turned pink the solution will be neutral. The bath works rather slowly, but the action is regular and even, and the deposition of the gold takes place under the most favorable conditions.

Gold sulphocyanide dissolved in an excess of ammonium sulphocyanide is the most popular toning bath at the present time, 30 grains of sulphocyanide being usually mixed with 2 grains of gold trichloride and 16 ounces of distilled water.

Gold chloride, by the way, should be always mixed with distilled water, as tap water contains a certain amount of organic matter and frequently iron also, both of which decompose the gold salt. Ferrous salts precipitate gold from solutions of its salts, and ferrous sulphate is often used to throw down the gold from old toning baths.

The phosphate, formate, tungstate, and borate of soda are among the most popular salts used in the preparation of gold baths. A borax bath giving good photographic purple tones may be prepared as follows:

Water	10 oz.
Borax	30 gr.
Gold chloride	1 gr.

The formate bath, on the other hand, give excellent warm-red tones, and may be prepared thus:

Water	10 oz.
Sodium formate	10 gr.
Gold chloride	1 gr.

Sufficient sodium bicarbonate must be added to the solution to make it neutral, between 1 and 2 grains being usually required. It is advisable to use a salt bath before toning when formate is employed.

One often meets with inquiries as to the best method of obtaining warm tones on P. O. P., and special baths are looked for. But, as a matter of fact, practically all varieties of warm, reddish-brown tones can be obtained by an ordinary gold bath, such as the sulphocyanide, if the prints are toned slowly and toning be stopped instantly when the desired color has been obtained. A weak solution of sodium sulphite, often called a "short-stop bath," is suitable for this purpose, and is prepared as follows:

Water	10 oz.
Sodium sulphite	1 dram.

This should be freshly made up. When the color which is wished for has been obtained, as seen by examining the print by transmitted light, the latter is removed to the sulphite solution, where toning is immediately arrested, and after a minute or two it is rinsed well and transferred to the fixing bath.

Collodio-chloride papers seem to be especially suited to platinum toning, while the borax or bicarbonate gold baths are quite suitable for gold toning. While in most cases the gold bath is alkaline (acid gold baths have been suggested from time to time), a platinum bath requires to be acid. Mr. Haddon's bath is a thoroughly reliable one, and the approximate formula is given below:

Platinum perchloride	1 gr.
Sodium formate	33 gr.
Formic acid	10 minims
Water	12 oz.

Those who prefer a bath which is simpler to prepare will find a nitric acid solution of potassium chloroplatinite work well, as suggested by Liesegang; while Valenta's formula, stated below, is a very popular one:

Potassium chloroplatinite	1 gr.
Metaphenylenediamine	1 gr.
Water	4 oz.

A bath containing 180 minims of phosphoric acid and 2 grains of the chloroplatinite in 10 ounces of water will also be found particularly suitable for collodio-chloride papers.

Combined gold and platinum toning yields good black tones, and is usually carried out by toning first slightly with gold, and then thoroughly with platinum. Black tones, or very cold blue ones, can be obtained with gold alone, but the prints should be made extra deep in order to stand the excessive conversion of silver into silver chloride.

Many exceptional baths have been suggested, such as a gold bath containing potassium iodide, for producing carmine tones, etc. One given by Valenta, in which uranium is used as the metal toner, is worthy of trial, and is as follows:

Uranium nitrate	5 to 10 gr.
Thiosinamine	45 gr.
Water	10 oz.

After the preliminary washing, the prints are rinsed in water acidulated with a few drops of acetic acid. The fixing bath should not be stronger than 3 ounces of thiosulphate to the pint of water.

Lastly, we come to a consideration of the combined bath, in which toning takes place simultaneously with fixing, and, to a great extent, *after* fixing. A P.O.P. print will, for instance, be thoroughly fixed, as a rule, in six or seven minutes, while prints are frequently left in a combined bath for a quarter of an hour. One advantage of the average combined bath is that double toning is seldom met with. Double toning is due most frequently to unevenness in the coating of the paper, but sometimes to uneven action of the toning bath, *i. e.*, a deposition of gold on the high lights at a different rate from that on the shadows. What must be guarded against in using the combined bath is the production of a greenish-gray tint in the faint details, which is due to sulphuration. The dangers of the combined bath may readily be seen when we remember that most acids decompose thiosulphate and liberate sulphur and sulphuretted hydrogen. Prints are put into a combined bath without a preliminary washing, and thus the citric acid in the film is free to react with the thiosulphate in the bath. The smell of sulphuretted hydrogen is experienced practically always in the use of the combined bath, and although the presence of a lead salt may take up most of the sulphur, it is probable that a fair proportion of silver sulphide, or "tone," is formed also.

Lumière has recommended a combined bath with which "permanent" prints are obtainable, and the following is the formula:

Warm water	20 oz.
Hypo	7 oz.
Alum	170 gr.
Lead acetate	17 gr.
Citric acid	17 gr.

Dissolve the hypo, citric acid, and alum, and when cold add the lead acetate. Allow to stand several hours, and then filter. Then add 1½

ounces of distilled water containing 7 grains of gold chloride to the clear filtered solution. If the bath is not going to be used up at once, it is best to only mix the necessary gold chloride with the portion to be immediately used.

The fault of many combined baths is that they work too rapidly, and there is a danger of taking the prints out before they are fully fixed. To avoid this, a supplementary hypo bath should always be kept handy, to which *toned* but *insufficiently fixed* prints may be transferred to finish off the fixing. This may, if desired, be rendered slightly acid with sodium sulphite, in order to arrest the toning action at once.—*Amateur Photographer.*

Intensification with Chromium

THIS process of intensification is not exactly new, seeing that the fact of its being a possible method was pointed out many years ago. At that time the reason of the intensifying action and the fact that it was actually due to the addition of a chromium compound, was not known. Photographers looked upon it as a curious experiment, rather than as a useful process, and it was not suspected that by proper adjustment of the ingredients used the power of the intensifying action could be increased to such an extent as to render the method a formidable rival to mercurial methods. A few years ago, however, the process was exhaustively studied, the results analyzed, and the conditions that govern the amount of control were determined. The process was rendered powerful and certain, and it then was speedily adopted by many workers. Its present popularity is proved by the fact that so many different manufacturers are now putting the materials upon the market in the form either of solutions or of that of compressed solid tablets.

It has the advantage of being a very simple process, and the necessary ingredients are to be found in practically every photographer's workroom. Nothing is required beyond some potassium bichromate, hydrochloric acid, and a suitable developer. The process is applicable to negatives, lantern slides, or bromide prints, and in each case the procedure involves the simple bleaching of the image, followed by washing. The result is then developed, washed again, and dried. The bleaching solution works at its best when freshly mixed, but the separate solutions keep indefinitely, and the mixing involves no trouble whatever.

A 4 per cent. solution of potassium bichromate is required, and also a 2 per cent. solution of hydrochloric acid, that is to say, one made by adding 2 parts of concentrated acid to 98 parts of water.

For use, we mix equal parts of these two solutions and immerse the plate or print in the mixture until the black image is changed to a yellow-brown one.

The bleaching action is finished when all traces of the black or gray image have gone. It will then be seen that the whole film is stained yellow, and the next operation is to wash until this yellow stain has gone. Twenty minutes in a syphon washing tank is generally ample for a

negative or slide; or we can wash by soaking, when half a dozen changes of water will usually suffice either for a print or plate. When washed, the image is redeveloped up to full blackness, then washed and dried. The most satisfactory redeveloper is anidol, but metolhydroquinone or glycine can be used if more convenient. Rodinal, metol, or hydroquinone used alone are not satisfactory, neither is ferrous oxalate, but pyro can be employed if a brown-colored image is not objected to. No bromide should be used with any developer.

The process can be repeated on the same film over and over again, but usually the first operation is sufficient. The image is generally of greater density than one would think as the result of mere visual examination, therefore it is advisable to make a trial print before repeating the process. If repetition is likely to be required, use the amidol developer. The others being strongly alkaline, are very likely to cause frilling if applied more than once to the same plate.

The process is very rapid and safe. The three common causes of failure are the use of stale bleaching solution or developer, exposure in too strong light before development, and the attempt to carry out the process on films that were not properly fixed in the first instance. The last cause is a prolific source of trouble with all kinds of intensification, while imperfect washing after fixing is fatal with nearly all processes except the chromium one. This can actually be applied to a fixed plate that has been rinsed only, though this procedure is not recommended, but perfect washing is essential before such other methods as uranium, or any of the mercurial or silver processes. As regards exposure to light, no exposure at all is necessary, as the image will develop quite readily without it, but there is no need to work in the dark-room or by artificial light. Diffused light is quite safe if the washing after bleaching is not carried on for more than about twenty minutes in an open dish. Long exposure to diffused daylight or a short one to sunlight will, however, render the image less easily developable, and may even render it quite undevelopable; therefore, such exposure should be avoided. Further than this, the developing operation should not be carried out in sunlight, for many developers stain most violently in a very strong light, though in other conditions they are quite stainless.

Two very valuable features of the process are its applicability to bromide prints and lantern slides. A weak bromide print is greatly improved in color by the process, and the effect produced on lantern slides is unequalled by any other process except that of silver intensification, which is a somewhat tricky and troublesome method in inexperienced hands. The chromium method gives a very fine black tone that is quite permanent, while mercury usually gives brown-toned results that are materially affected by the heat of the lantern.

Brooch and Pendant Portraits

At the present time the fashion of wearing pendants, brooches, or buttons bearing a portrait of some near friend or loved one—always

popular and now almost general—has received a further impetus owing to the forced separation of relations and friends due to the exigencies of the war. Personal gifts of this character given to those about to leave for the fighting lines or for service abroad, or, from those going away, to the ones left behind are always highly prized and cherished, doubly so if the gifts in question have the additional value of being the personal handiwork of the donor. A simple method, and one well within the capacity of every amateur, is described below.

Briefly stated, the procedure consists in sandwiching a film portrait between glass and plaster of Paris; the photographic film being permanent in character, and quite sealed from chemical action of the air, finger marks, abrasions, and all accidents falling short of an actual smash.

Photographers in the habit of making carbon or bromide prints will have most, if not all, of the requisites to hand. In addition to the purely photographic articles, a supply of glasses suitable to the work in hand and a small quantity of fine plaster of Paris will be necessary, in neither case expensive or difficult to obtain. First, as to the glasses. The size and shape will be governed by the use to which the finished portrait will be put, the portrait subsequently being taken to suit this size, or else negatives already made will be used, and the article and glass chosen accordingly. Nearly all jewellers and fancy dealers stock brooches and pendants fitted with glasses, but very rarely will the glasses in these be found suitable to the present purpose. The best plan is to have the article—whatever it may be—fitted with a good quality watch-glass, not the type known as "flat crystal bevel," but with such as have slightly curved edges to an almost flat surface as the

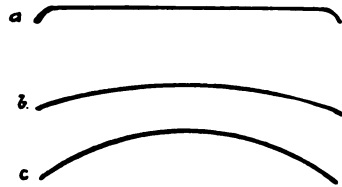


Fig. 1

section *a*, Fig. 1, or with a slight curved surface as in section *b*. Domed glasses as *c* must be avoided owing to the difficulty of obtaining optical contact between the glass and film in the transferring operations. No difficulty should be experienced in procuring these glasses to fit any standard size of fitting. The plaster of Paris demands no special description other than that it must be of fine quality, quite free from dirt or grit, and quite fresh.

In most cases the portrait to be used will be of the vignettted head and bust type. No special type of negative is required, but those made with white or light backgrounds are easier to vignette.

Our first object is to obtain a positive trans-

parency upon the inner or concave side of the glass, and for this purpose we can use either the carbon or the bromide process. If the carbon process is used we proceed in exactly the same manner as in making a carbon lantern slide. It is possible with extreme cleanliness and care to develop the printed carbon tissue direct onto the glass surface, but a safer and more reliable plan is to coat the glasses with a warm solution of—

Gelatin	$\frac{1}{2}$ oz.
Bichromate of potash	1 dr.
Water	40 oz.

When dry and briefly exposed to daylight for a few minutes they are ready for use. This treatment gives the surface of the glass a "grip" it would not otherwise possess. Reversed negatives are not required, as in this use of the carbon process the side shown in the finished result is that which we should deem the "back" of a single-transfer carbon print. The tissue should

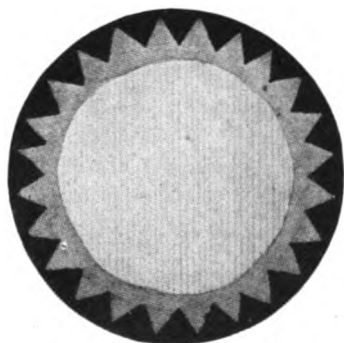


Fig. 2

receive the same exposure as that given for a print on paper, and when developed upon the glass should appear, when viewed by transmitted light, very much weaker in density than an ordinary transparency or lantern slide. When developed the glasses are rinsed in a weak solution of alum, again rinsed in cold water, and then stood on edge to dry in a place quite free from dust.

► An alternative method of making the transparency was suggested by the introduction of the bromide paper made and sold by the Kodak Co. as transferotype paper. Since this paper was placed upon the market I have used it for this purpose with excellent results, and although the extreme range of colors that the use of the carbon process gives is lost, the finished results otherwise are indistinguishable one from the other.

The initial bromide print on the transferotype paper is made and developed in the usual way, and can be toned by any of the ordinary toning formulæ. The delicacy of the finished result will depend in great measure upon the vignetting, and every care should be taken to obtain nicely balanced vignettes with softly graduated edges.

To anyone not used to making vignetted prints of small size the method adopted may prove of use. A piece of card large enough to well cover the printing frame is taken, and a hole cut in this the size and shape—round or oval, as the case may be—of the glass it is proposed to use. A piece of white tracing paper—tissue paper answers quite as well, but is not so durable—is damped and pasted on to the card so as to cover the hole. When quite dry the center of the tracing paper is cut away with the point of a sharp knife, leaving a "fringe" of paper round the hole; the "fringe" being left in depth about one-seventh the diameter of the hole. Over this another piece of tracing paper is fixed and left whole, care being taken that no paste adheres to any of the papers covering the hole in the card, or uneven lighting will ensue. This card arrangement is fastened by means of small tacks to the front of the printing frame, about one-third of an inch from the negative, and so adjusted that the head to be vignetted is in the center of the body of light coming through the card. It will be found that with light backgrounds this will give vignettes of the desired character without movement of the card or frame. If dark backgrounds are used, it may be found necessary to cut a hole with serrated edge in a piece of opaque paper, and to superimpose this half over the "fringe" mentioned above. Fig. 2 shows the completed card as seen with the light coming through it.

The instructions given by the makers of the paper for transferring the film from the paper to the glass must be slightly modified, as it is not possible to use the squeegee upon small curved surfaces. Optical contact between the print and glass is obtained by the gentle use of the tips of the fingers covered with a damp, soft handkerchief. The heat of the fingers is sufficient to soften and distort the film, consequently it is advisable to place the print and glass into position, and to expel as much air as possible from between them while they are still under water, any remaining bubbles of air and water being gently pressed out to the edge by the finger-tips until close contact is observed. Except in this one matter of squeegeeing, the makers' instructions should be rigidly followed until the transparencies are dried, when the final operation, which consists of filling the glasses with plaster of Paris, can be undertaken.

The plaster of Paris, which must be quite fresh and not slaked by the action of damp air, should be mixed to the consistency of thin cream, and then poured gently and steadily into the center of the glass. Care must be taken to avoid the imprisonment of air bubbles between the film and plaster, but this should not occur if the plaster is poured in a thin steady stream. The glasses should be filled until the plaster rises above the edges, and then allow to "set," the surplus plaster being subsequently removed by scraping it away with the straight edge of a table knife.

Little remains to be done but to clean the surface of the glasses and attach them to their respective fittings.

In the case of pendants two glasses of similar size can be placed back to back while the plaster is still moist and unset; the whole when dry can then be inserted into a setting with a portrait each side of it.

If necessary the transparencies can be spotted or even colored prior to filling with the plaster, and a variety thus introduced into the results.

The process lends itself to work in large sizes as well as for the purpose given above. One need only be bound by the limits to the size of glasses than can be obtained.—*Amateur Photographer*.

Collotype Prints from Bromide Paper

BROMIDE paper as used for ordinary contact printing and enlarging may be used as a printing surface for the production of a small quantity of proofs, and has the advantage over ordinary collotype that, from any negative that will yield a good bromide print or enlargement, it is possible to make a collotype printing-film with image same size, reduced, or enlarged, and at a very small cost.

The bromide paper used for this purpose is what the manufacturers classify as semi-matt, carbon surface, or velvet surface; glossy surface paper can be used, but it is apt to blister quickly. Some manufacturers make a special paper and call it bromoil.

The prints or enlargements should be just a little overexposed, and developed until the highest light is decidedly tinted. The developer that is the best is:

Pyrogallic acid	1 oz.
Metabisulphite potash	1 oz.
Potassium bromide	$\frac{1}{2}$ oz.
Water	9 oz.

Label, "stock pyro."

Developer No. 1

Stock pyro	1 oz.
Water	9 oz.

Developer No. 2

Liquor ammonia 0.880	1 oz.
Water	9 oz.

Mix No. 1 and No. 2 in equal parts. After development, fix in:

Hyposulphite of soda	2 oz.
Metabisulphite of potash	60 gr.
Water	16 oz.

These prints or enlargements, like a collotype plate, must have a white margin all round, of at least one inch in extent, because if the inking roller has to be used up to the edges the film will come away.

After fixing in hypo the print or enlargement must be thoroughly well washed and then dried.

When dry the print or enlargement is immersed in a solution made up of

Copper sulphate	130 gr.
Common salt	720 gr.
Potassium bichromate	30 gr.
Water	20 oz.

This is used at a temperature of 75° F.

The image quickly bleaches to a bright yellow; then wash well in ten or twelve changes of water; now immerse for five minutes in the hyposulphite fixing bath as above; again wash in at least twelve changes of water.

The next operation will be to lay the print, face up, on a sheet of zinc, and to dab surface dry with a damp chamois leather, when it is ready for inking-up. This inking-up is done with an india-rubber roller which has previously been treated on a lathe with coarse emery cloth or glass paper until the surface is like a piece of velvet. Such a roller takes ink easily, and parts with it just as readily without undue suction. This roller is charged with ink a little thinner than ordinarily used for collotype and a more gentle pressure is used. The image will require some little time at first to get the ink to take, but once it starts no trouble will be met with. The best press for these prints will be either an ordinary letter-press, such as an Albion, or, failing this, an ordinary domestic india-rubber wringer that has not had the rollers twisted by domestic use. Any of the usual means sometimes necessary to coax a collotype plate into inking-up properly may be employed for this medium, and the usual etching fluids may be used, but the surface must only be dabbed with a damp leather, not rubbed, nor is it advisable to use the usual damping rag.—W. T. WILKINSON in *Process Monthly*.

The Simplicity of the Carbon Process for Portraiture

At the present time there seems to be a taste for photographs in almost every color except the old orthodox photographic color, and, of course, enterprising portraitists cater for it, and often by troublesome methods, such as by toning bromides, for example. But, after all, this is a clumsy way when a simpler is at hand. Those who have undertaken to produce, say, a dozen prints by this means—all of the same tone—are fully aware of the difficulty they will meet with. Now, with the carbon process there is no such difficulty, because tissues of almost every color of the rainbow are now on the market, and whichever one is selected all prints made upon it will be of exactly the same tint. It is thought by many that the carbon process by the double transfer method, by which the pictures are non-reversed as regards right and left, is troublesome to work. But why work the double transfer method at all? Why not produce reversed negatives? Then the single transfer method, the simplest of all photographic processes, may be used. There are many ways by which reversed negatives may be made. One is by stripping the film from the glass and printing from the reverse side. This method is troublesome, and will not, we think, appeal to the general body of portraitists. The portrait may be taken with the aid of a prism, either before or behind the lens; but a prism of good quality, suitable for a good-sized portrait lens, is a somewhat costly affair. But reversing mirrors are by no means so, as they may be had at quite a moderate cost, and when kept in a

good state of polish add very little indeed to the exposure.

There is yet another method which entails no outlay whatever. It is simply to put the plate in the slide with the glass side toward the lens, of course, making allowance for the thickness of the glass in the focusing. As the glass now used for dry plates is so uniform in thickness there need be no difficulty from this source. There is no more difficulty in developing a plate exposed through the back than when it is exposed on the film side, but the appearance of the image must be watched for from the glass side, and not from the film side, density being, necessarily, judged in the ordinary way. It may, *en passant*, be mentioned, that negatives made in this way are free from halation arising from reflection from the back of the glass. It goes without saying that the back of the plate must be carefully cleaned before it is put into the slide. Once our reversed negative is obtained—by whatever means—the production of carbon prints from it in any color becomes the simplest of all photographic processes. All one has to do is to expose the tissue—which may be of any color—mount it on single transfer paper, and simply develop with warm water, and fix it in a solution of alum, and then we have a picture of unquestionable permanence. There is one thing that may be mentioned in connection with the single transfer method and its advantage over the double, which is that the prints may be made on the coarsest surfaced papers, which is not possible by double transfer. An objection may be made to the fact that reversed negatives cannot be used for ordinary printing unless we are content to have the image, as regards right and left, reversed. But why not, at the time of sitting, if ordinary prints are thought to be necessary, take two negatives—the one reversed and the other the right way about? All modern studio cameras are fitted with repeating backs and double dark slides, and what is easier than to put in one plate one way and the other the reverse?—*British Journal of Photography*.

Making a Ground-glass Screen

A PIECE of finely ground glass is not difficult to make. Two pieces of ordinary glass, as two spoiled negatives with the whole of the coating cleaned off, and fine knife powder form the materials required. One of the pieces of glass should be fastened by means of five or six brads or tacks to the surface of a bench or board, taking care that the heads of the tacks are below the top surface of the glass. A little knife powder is then dusted over the glass, and it is sprinkled with water, and then the other piece of glass being placed upon the top of it, the two surfaces are ground together with a constantly varying motion. By pressing on the top glass with outspread fingers it is possible to equalize the pressure over the whole surface. From time to time the two glasses are washed and wiped dry to see how the surface is progressing. If any spots remain bright, they may have especial attention by putting a little powder on them and by pressing on the top glass just over them while continuing the grinding. As both the

surfaces in contact are ground in the process, it is as well to finish all the clear spots on both in this way, so that the result of the work is two focussing screens, both ready for use. A couple of half-plates should be ground in this way in less than a quarter of an hour, and if the powder used is fine the grain of the glass will be fine also.

Gum Backs for Prints

THE commercial photographer often has occasion to deliver prints with gummed backs. The gum must be dry, but it must have adhesive qualities that will permit of its being mounted on any suitable support simply by moistening it as one does a postage-stamp.

The following formulæ have been found very satisfactory, and should be added to the information in your scrap book of formulæ, if you have such a means of keeping information where it may always be found when you need it:

Water	5 parts
Fish glue, or liquid glue	10 parts
Glucose (liquid)	5 parts
Alcohol (denatured)	5 parts

Heat the water and stir in the glue, glucose and alcohol. Add a few drops of carbolic acid, to prevent fermentation, and thin down with water to the required consistency.

The following modified dextrin formula may also be used with good results:

Dextrin	10 parts
Water	10 parts
Acetic acid (glacial)	5 parts
Glucose (liquid)	5 parts
Alcohol (denatured)	5 parts

Warm the dextrin and water, add the acetic acid, and heat. Stir in the glucose, and finally add the alcohol and a few drops of carbolic acid. Thin with water as required. The function of the glucose is to prevent the adhesive coating from cracking. If the coating is too tacky when dry, use less glucose.

The solution is applied with a brush and the prints hung up in a dry atmosphere. They dry very quickly, unless too much glucose has been used, and should remain dry so long as they are not subject to dampness.—*Photo Digest*.

Cold Weather Difficulties

THE most experienced professional will occasionally turn out a batch of poor negatives, especially during the cold weather. As a rule he is able to put his finger on the cause of the trouble, but there are instances where the cause is so simple that it is apt to be overlooked.

Fuzzy, lifeless negatives can often be accounted for by the moisture in a warm studio condensing on a lens brought in from a cold room. Many professionals keep their lenses in a handy cupboard in some room near the studio. The studio may be quite warm, but the cupboard may be like an icehouse. A lens brought straight from this low temperature will very soon be

covered with moisture. The obvious remedy is to keep the lenses in a warm room.

The same trouble is often met with in commercial photography. An operator, sent out to do some work in a factory or workshop, goes straight from the cold outside air into a heated room and sets up his camera. The moisture collects on his lens, and, very probably, in the dimly lighted interior it is not noticed during focussing. The moisture can always be prevented by waiting until the lens is brought up to the temperature of the room.

Another cause, often unsuspected, is actual haze in the studio. This is generally more noticeable in full or three-quarter length portraits than in large heads, because the further the camera is away from the sitter the greater is the amount of intervening haze.

When haze is present, care should be taken to screen off all light which is not required for the portrait. It is not wise on dull, hazy days to open all the blinds. This is often done to secure greater detail, but very often it only produces fog. Shielding the lens from the direct rays of light is not enough; the remedy is to avoid illuminating the haze between the camera and the sitter. This is particularly important when artificial light is used. Winter haze can, of course be considerably reduced by keeping the studio warm and dry.

There are times, too, when the light appears good but is so lacking in actinic power that even the most experienced operator may under-expose. To avoid this some firms insist on their operators exposing and developing a plate twice a day. Certainly on busy days, when the developing is left until the evening, this method, or the use of an exposure meter, will often save a batch of negatives.

Even when exposures are correct, a cold developer will lead to weak, lifeless negatives. If the professional does nothing to raise the temperature of his developer, when a spell of cold weather comes along, what can he expect for his thoughtlessness but underdeveloped negatives? Every developing solution loses its power rapidly as its temperature falls, and a very cold solution has scarcely any developing power at all. The temperature should never be below 65°.

When the inexperienced worker encounters under-exposure or under-development, he generally jumps to the other extreme. He forgets that over-exposure will produce flatness and that a developer which is too hot will produce fog.—*Professional Photographer.*

Prize Slides and How to Make Them

THE production of a first-class lantern slide is acknowledged to be a hall mark of good technic. Not only is this so, but a good lantern slide goes even one better, and gives a picture with a far longer range of tones and more delicate gradations than any other printing process, with the exception perhaps of the multiple gum.

Again, lantern slides provide those workers who are of an experimental bent with a most interesting and exciting field for research.

On starting lantern-slide making the first

stumbling-block is, what is the correct density? A fairly good test in the case of black and white slides is to look through the most dense part of the slide at some fairly small print, held about two feet behind the slide, illuminated by a bat's-wing burner. If now you are able to read the print, the slide should, as far as density in the shadows is concerned, be about right; at the same time the highest lights should have a suspicion of a deposit or a very slight veil all over them. This type of slide, it will be found, works fairly well with any illuminant.

Warm-toned slides are more difficult to judge, owing to the color of the deposit; the more violet the slide is by transmitted light the greater the density.

It is, of course, whenever possible, best to try slides, especially warm-toned ones, in the lantern, as it is only in this way that the slide-maker can learn the required density of his slides.

With regard to negatives, any type of negative can be made to give a good slide, but those most suitable for P. O. P. printing will make the best black and white slides, but for the warmer tones a thin bright negative will give the brighter slide and the better color.

All spots, pinholes, scratches, etc., should be carefully "doctored" on the negative.

The best slides undoubtedly are made by reduction in the enlarger or by copying, etc. The reason for this is not difficult to find. Firstly, it is next door to impossible to obtain a negative and lantern plate with true surfaces, consequently optical contact cannot be obtained, which means an attendant loss of definition in the final slide. For the same reason the chances of bits of dust getting between the negative and lantern plate will also diminish the chances of critical definition.

Exposure should be such that when the high-lights of a picture just begin to veil over in the developer, the shadows have just sufficient density but are at the same time not in the least clogged up or choked. This sounds a tall order, but with a little experimenting it will be found quite easy to judge the exposure fairly correctly in nine cases out of ten.

Remember that a short exposure to a powerful light gives warmer and brighter tones than a lengthy exposure to a weak light.

Developers. Warm black, sepia, and warm browns are always the favorite tones for effective slides, and the following formulae, worked out by the late Mr. F. P. Cembrano, can be recommended as among the best for this purpose.

Four solutions are required, and all keep well for at least a year:

No. 1

Pyro	1 oz.
Sodium sulphite	2 oz.
Citric acid	1 dr.
Water	5 oz.

No. 2

Potassium hydrate	1 oz.
Water	5 oz.

(This solution must be well shaken before using.)

No. 3	
Ammonium bromide	$\frac{1}{2}$ oz.
Water	5 oz.

No. 4	
Ammonium carbonate	$\frac{1}{2}$ oz.
Water	5 oz.

This works well with any lantern plate if balanced up to suit that plate. An idea of the colors obtainable with various constituents of developer is appended:

Pyro.	No. 2.	No. 3.	No. 4.	Water.	Average Time of Development.	Color.
Drops.	Drops.	Drops.	Drops.	Oz.		
30	50	30	60	$1\frac{1}{2}$	4	Warm black
30	50	30	90	2	6	Cold sepia
30	50	30	100	3	10	Warm brown
30	50	40	120	4	15	Violet black

The above gives some idea of the colors obtained with various alterations to the developer's composition. Of course, the reader may ring any change he cares to try in his constituents, and so obtain varying colors.

After development the plate is swilled, fixed, and washed in the ordinary way.

The next developer recommended is more suitable for slow chloride or chloro-bromide plates, but works fairly well with the faster "black tone" bromide plates.

It is a good acid amidol formula, worked out by M. Balagny, and published in the *Société Française Proceedings*. For transparency and beauty of results it is hard to beat, while the regularity of the pure sepia slide obtained is extraordinary. The exposure required is normal, and the density of the slide depends on the time of development. An average slide should be fully developed in ten minutes; short development gives a weak slide, longer development a richer and stronger slide.

The developer is compounded as follows:

Amidol	11 gr.
Bisulphite of soda solution	$3\frac{1}{2}$ dr.
Ammonium bromide, 10 per cent. solution	2 dr.
Water	10 oz.

The sodium bisulphite solution is made by dissolving 140 grains of sodium sulphite in one ounce of water, and adding the above solution to $4\frac{1}{2}$ drams of bisulphite lye solution. The bisulphite lye solution can be bought or it can be made by dissolving 3 ounces of sodium sulphite in 7 ounces of warm water. When the solution is cool add $\frac{1}{2}$ ounce of sulphuric acid drop by drop, constantly stirring the solution. This operation should be performed out of doors, as a great quantity of sulphurous acid is given off, which is a most irritating gas to inhale.

The image on making its appearance is of a

chocolate-brown color, and as development proceeds the color changes to sepia.

This developer has given excellent results with Imperial gaslight, Ilford Alpha, Edwards' Kristal, and Paget slow. The results on Marion chloro-bromide are fair, the image taking a long time to develop, the same thing happening with Wratten's. This developer should be used at 65° F.

The following hydroquinone developer works practically with any lantern plate. The developer is made up as follows:

No. 1	
Water	10 oz.
Sodium sulphite	250 gr.
Hydroquinone	40 gr.
Sodium carbonate	250 gr.

No. 2	
Ammonium bromide	240 gr.
Ammonium carbonate	240 gr.
Water	10 oz.

For black tones take 2 ounces of 1 and 6 drops of 2. For warmer tones add more of 2 and prolong exposure.

The temperature of the developer must be at least 65° F. The tone given on Paget slow and chloride plates in general is a cold sepia, while Wratten, Imperial special transparency, etc., give a very cold black. Time of development, six to ten minutes.

A most important point in using this developer is to well rinse the plates between developing and fixing, otherwise a yellow hydroquinone stain is very apt to appear. There is also this tendency if developing is forced.

This note on lantern-slide developers would not be complete without reference to one worked out by Kodak Co. for Wratten plates, giving a very fine slate-gray on violet-black. The formula is published in their brochure on lantern slides, and is thus given:

No. 1	
Metol	44 gr.
Hydroquinone	22 gr.
Sodium sulphite	1 oz.
Sodium carbonate	1 oz.
Water	20 oz.

No. 2	
Ammonium sulphocyanide	$2\frac{1}{2}$ oz.
Potassium bromide	60 gr.
Water	10 oz.

For use take 7 drams of 1 and 1 dram of 2. The plate should be developed in two and a quarter minutes at a temperature of 65° F. The exposure required is 50 per cent. above normal.

As the deposit is white by reflected light, and the image therefore hard to judge, it is advisable to work by time as much as possible.—*Amateur Photographer*.

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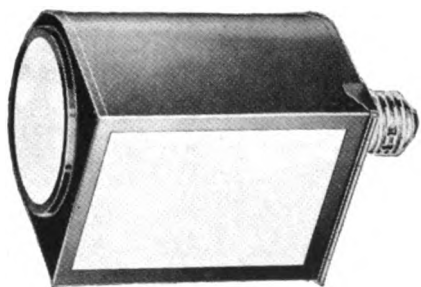
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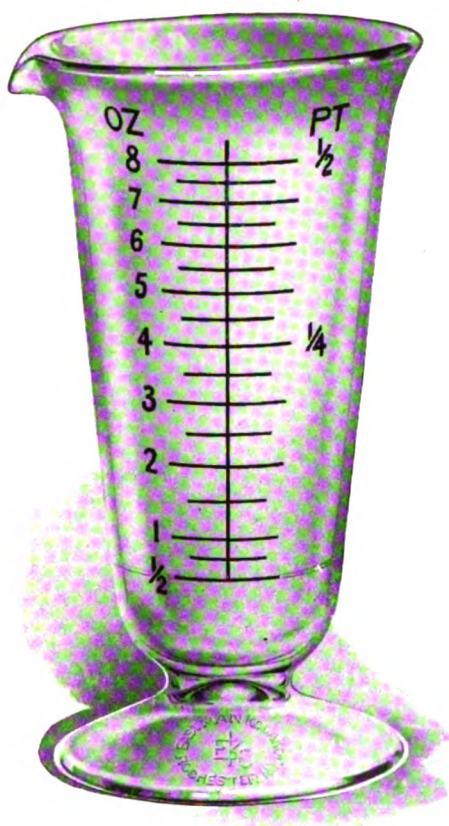
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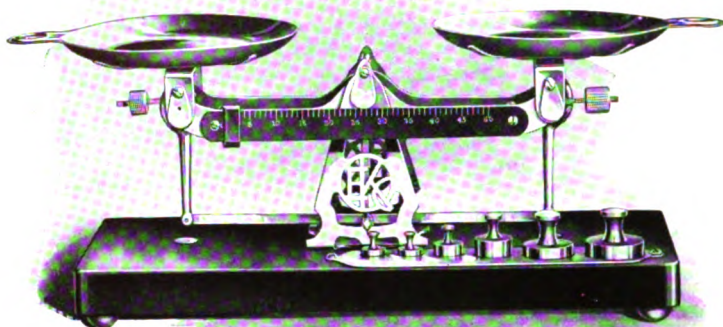
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